

# SPECIFICATIONS FOR T38 SERIES

## Single Junction Infrared LED

Model: EMC 3838-90°

Part No: T38IR011A-xxxxxx

**Features:**

- \* Top view Infrared LED
- \* High Power Infrared LED
- \* Low Thermal Resistance
- \* Pb-free Reflow Soldering Application
- \* RoHS and REACH compliant



**Applications:**

- \* Surveillance Systems
- \* Machine Vision
- \* License Plate Scanning
- \* Automotive Sensing
- \* Night Vision

## Part Numbering System

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X1 X2 X3 X4 X5 X6 X7 X8 X9 X10

Item Number Code	Description	Content
X1	Type code	1S:1010; 1A:1919; 20:2016; 3B:3014; 28:2835 34:3020; 3C:3030; 5C:5050; 7C:7070; 1D:100100; 19: Ceramic 3535; 15: Ceramic 5050; 11: Ceramic 1616.
X2	CCT code	BL: blue ; GR : green; YE : yellow; RE : red; PA: PC Amber ;IR :Infrared; UV : ultra violet;CW:RGB; FW: RGBW
X3	Color Rendering	Color :0.
X4	No. of serial chip	1-Z.
X5	No. of parallel chip	1-Z.
X6	Component code	A-Z.
X7	Color Code	M:ANSI; F:ERP; R:85°C ANSI; T:105°C ANSI; B:Backlighting; Q:Others;AT:Tospo
X8	Internal code1	\
X9	Internal code2	\
X10	Spare code	\

## Electrical/Optical Characteristics at Ta=25°C

Item	Symbol	850nm	940nm	unit
Forward Current	$I_F$	350	350	mA
Radiant Flux	$\Phi_e$ (Typ.)	260	205	mW
Forward Voltage	$V_F$ (Min.)	1.2	1.2	V
	$V_F$ (Typ.)	1.5	1.4	V
	$V_F$ (Max.)	2.0	2.0	V
Peak Wavelength	$\lambda_p$ (Typ.)	850	940	nm
FWHM Typical	$\Delta\lambda_{1/2}$	30	30	nm
View Angle	$2\theta_{1/2}$	90	90	°
Thermal resistance	( $R_{th\ j-sp}$ )	4.5	4.5	°C/W

- \* Tolerance of measurements of the Forward Voltage is  $\pm 0.1V$ .
- \* Tolerance of measurements of the Radiant Flux is  $\pm 7\%$ .
- \*  $2\theta_{1/2}$  is the off-axis where the Radiant Flux intensity is  $1/2$  of the peak intensity.
- \* Tolerance of measurements of Peak Wavelength is  $\pm 2.0nm$
- \*  $R_{th\ j-sp}$  is the thermal resistance from LED junction to solder point on MCPCB with electrical power.

## Absolute Maximum Ratings at Ta=25°C

Item	Symbol	Absolute Maximum Rating	Unit
Forward current	$I_F$	1500	mA
Power Dissipation	$P_D$	3000	mW
Reverse Voltage	$V_R$	5V	V
Operating Temperature	$T_{opr}$	-40~+105	°C
Storage Temperature	$T_{stg}$	-40~+105	°C
Junction Temperature	$T_j$	115	°C
Electrostatic Discharge	ESD (HBM)	2000	V
Soldering Temperature	$T_{sld}$	Reflow Soldering: 230°C or 260°C for 10sec	

- \* LED's properties might be different from suggested values like above and below tables if operation condition will be exceeded our parameter range. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
- \* All measurements were made under the standardized environment of Lightning LED.

## Bin Structure

### Radiant Flux Bins, IF = 350mA, Ta =25°C

Radiant Flux			
Bin Code	Min.	Max.	Unit
JK0	180	200	mW
JL1	200	225	mW
JL2	225	250	mW
JM1	250	280	mW
JM2	280	315	mW
JN1	315	350	mW

\* Tolerance of measurements of the Radiant Flux is  $\pm 7\%$ .

### Peak Wavelength Bins, IF =350mA, Ta =25°C

Bin Code	Min.	Max.	Unit
XE0	840	860	nm
XF0	860	880	nm
XJ0	920	940	nm
XK0	940	960	nm

\* Tolerance of measurements of the Peak Wavelength is  $\pm 2.0\text{nm}$ .

### Forward Voltage Ranks, IF =350mA, Ta =25°C

Bin Code	Min.	Max.	Unit
AA3	1.2	1.4	V
AA4	1.4	1.6	V
AA5	1.6	1.8	V
AA6	1.8	2.0	V

\* Tolerance of measurements of the Forward Voltage is  $\pm 0.1\text{V}$ .

## Typical Characteristics Curves

Fig 1. Typical Spectrum, Ta = 25°C

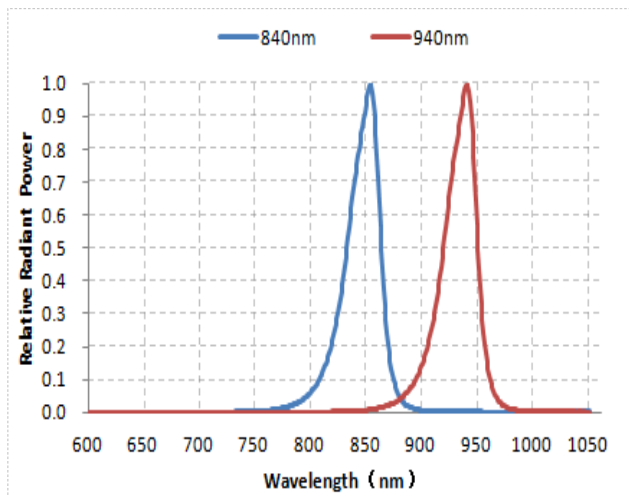


Fig 2. Forward Current vs. Relative Intensity, Ta = 25°C

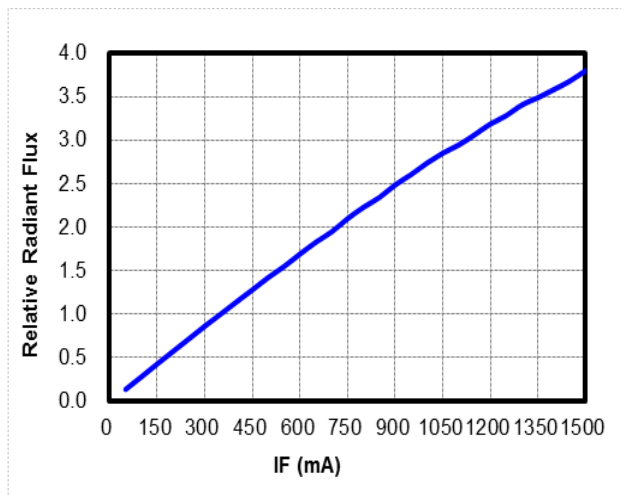


Fig 3. Forward Current vs. Relative Voltage, Ta = 25°C

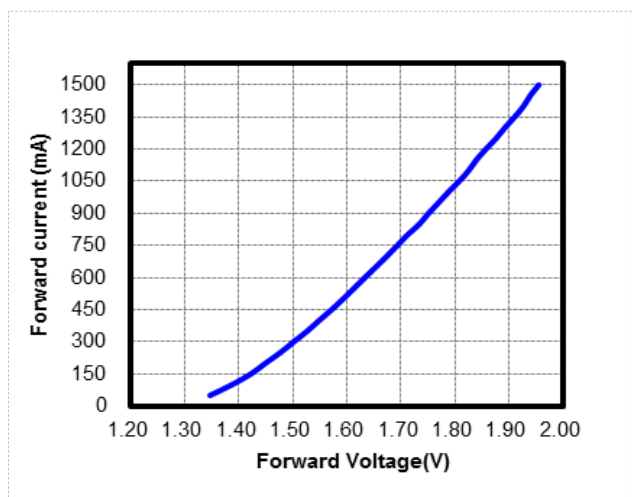


Fig 4. Ambient Temperature vs. Relative Output Flux

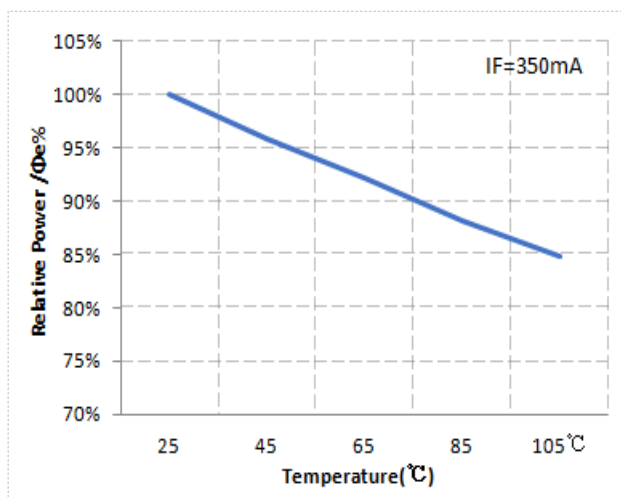


Fig 5. Typical Viewing Angle =90° , Ta = 25°C

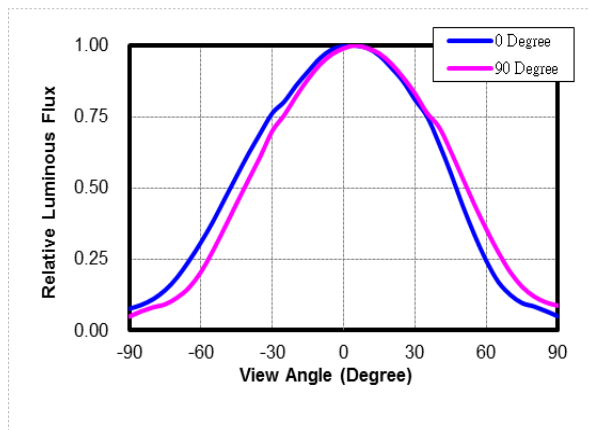
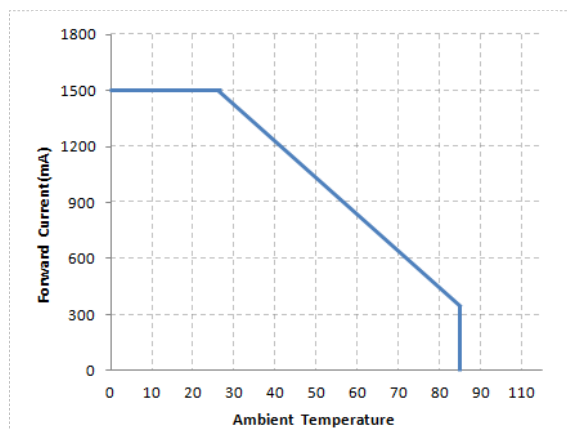
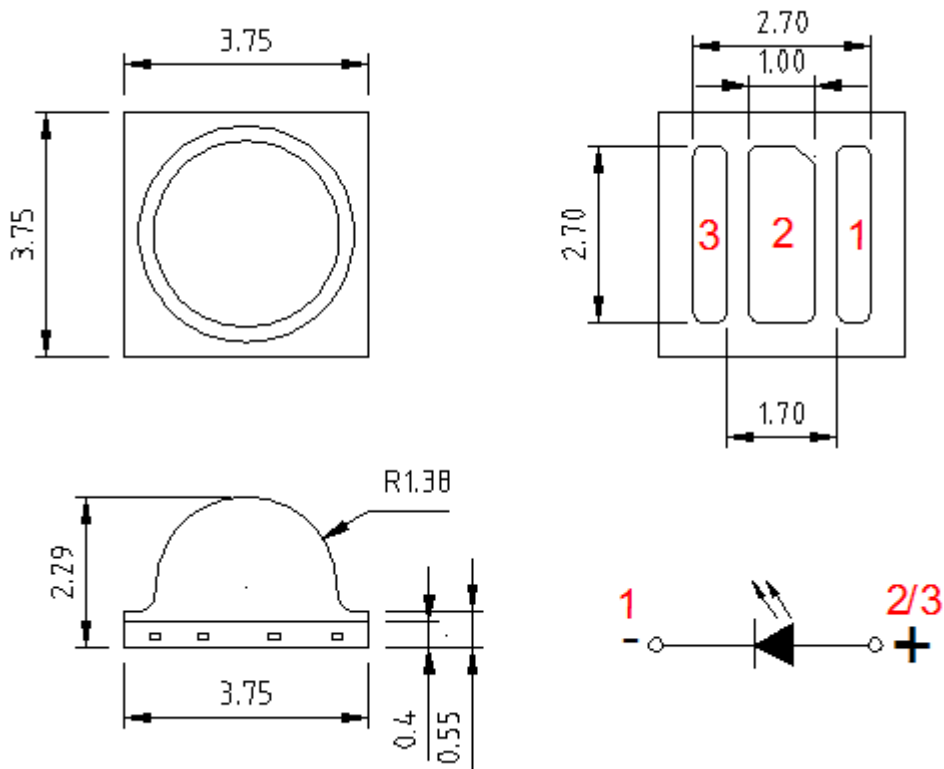


Fig 6. Ambient Temperature vs. Maximum Forward Current

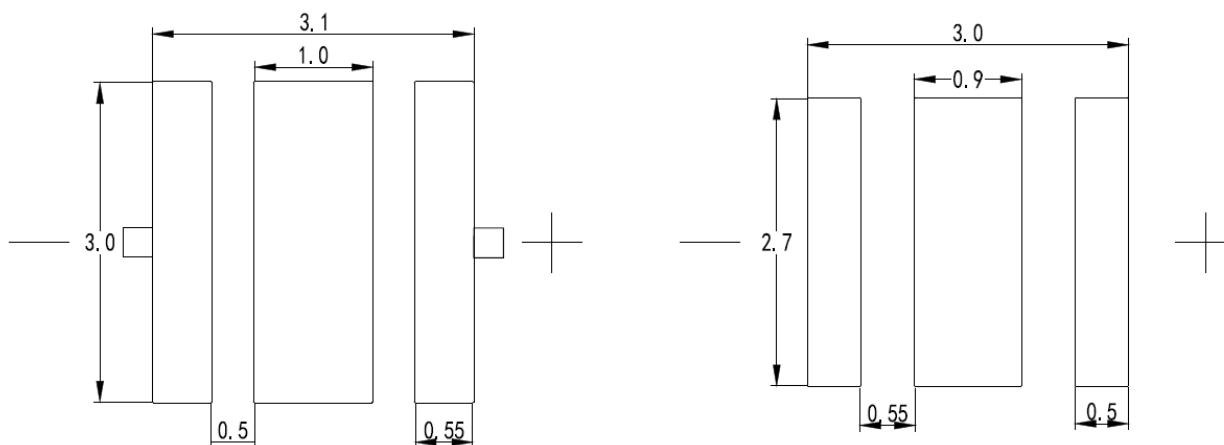


## Package Dimensions



\* The tolerance unless mentioned is  $\pm 0.2\text{mm}$ , unit = mm

### Recommended Solder Pad

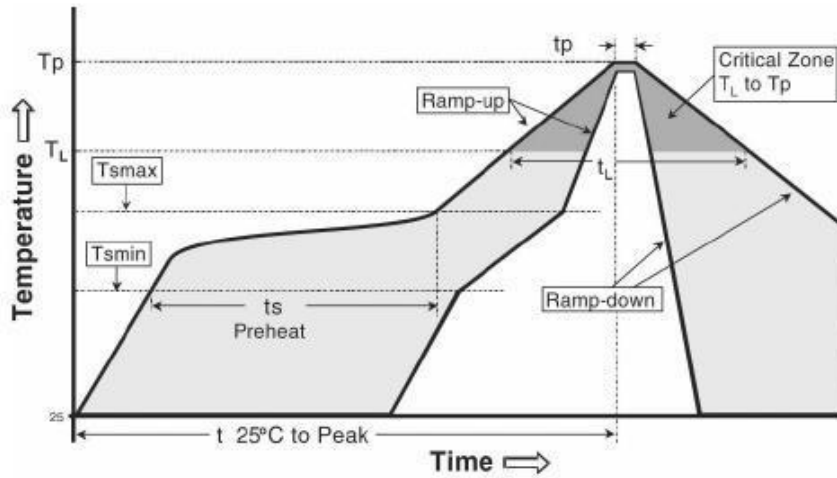


Recommended solder pad

Recommended stencil

\* The tolerance unless mentioned is  $\pm 0.1\text{mm}$ , unit = mm opening

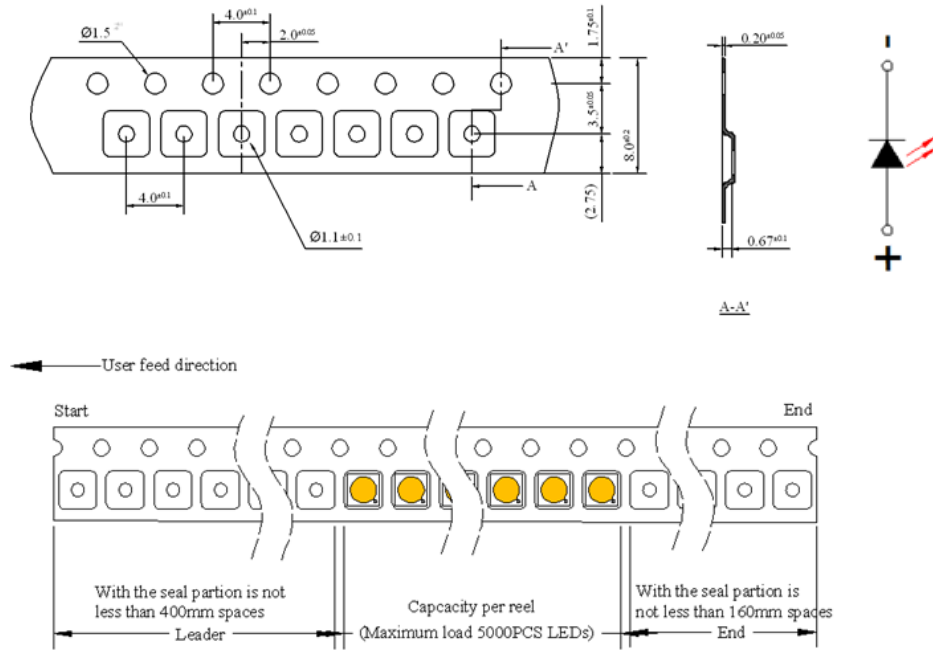
## Reflow Soldering Characteristics



Reflow soldering	
Temperature Min (Tsmmin)	150° C
Temperature Max (Tsmmax)	200° C
Time(ts)from ( Tsmmin to Tsmmax)	60-120 seconds.
Ramp-up rate (TL to Tp)	3° C/seconds max.
Liquidous temperature( TL)	217° C
Time(tL) maintained above TL	60-150 seconds
Peak package body temperature( Tp)	260° C max
Time (tp) within 5° C of the specified classification temperature (Tc).	30 seconds max
Ramp-down rate (Tp to TL)	6° C/second max
Time 25 ° C to peak temperature	8 min max

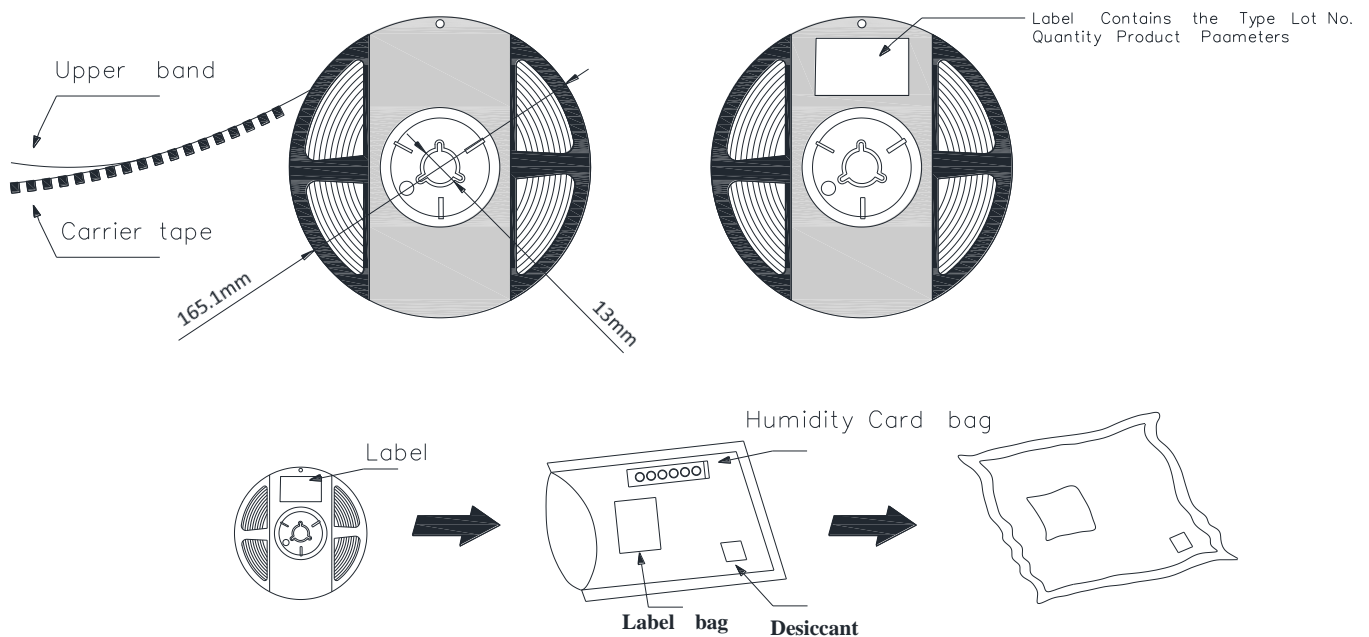


## Package Dimensions of Tape

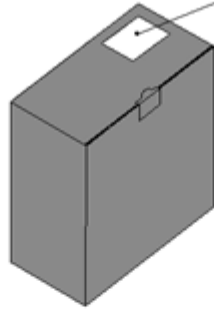
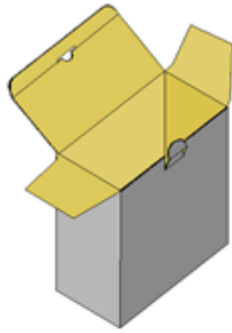


- \* Quantity : Max 1000pcs/Reel
- \* Cumulative Tolerance : Cumulative Tolerance/10 pitches to be  $\pm 0.25\text{mm}$
- \* Package : P/N, Manufacturing data Code No. and Quantity to be indicated on a damp proof Package.
- \* unit = mm

## Package Dimensions of Reel

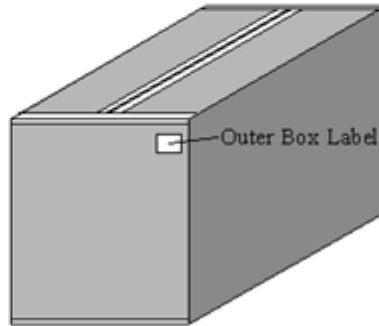
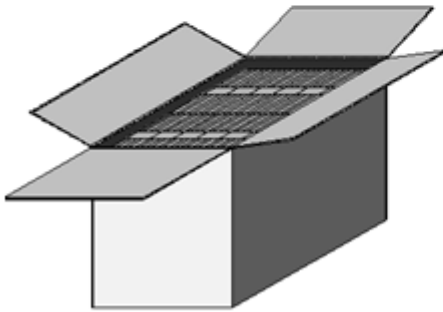


## Package Box





Label: Contains Type,  
Lot NO, Quantity, Product  
Parameters.

\* Capacity 4 or 8 reels per box.



\* Capacity 48 or 64 reels per box.

## Label (标签)

<b>福建天电光电有限公司</b> FUJIAN LIGHTNING OPTOELECTRONIC CO.,LTD	
型号 Type:	T*****_*****
	
辐射功率 $\Phi_e$ @ ***mA:	*** - *** mW
峰值波长 $\lambda_{p}$ @ ***mA:	*** - *** nm
电压 $V_f$ @ *** mA:	** - ** V
Lot No.:	AN***** - * - *****
数量 QTY:	*** PCS
	

## Caution

1. Reflow soldering is recommended not to be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged.
2. Repairs should not be done after the LEDs have been soldered. When repair is unavoidable, suitable tools must be used.
3. Die slug is to be soldered.
4. When soldering, do not put stress on the LEDs during heating.
5. After soldering, do not warp the circuit board.

## Notes on Lightning Ceramic Series soldering:

1. Recommend to use reflow machine.
2. Recommend to use heating plate soldering.
3. Manual soldering is not recommended.

## Notes on reflow process:

1. To confirm whether the actual temperature curve in the reflow soldering conditions comply with recommended conditions. LEDs are guaranteed for one time reflow.
2. During reflow process do not apply force on LED active area.
3. After reflow process, PCB board should be cooled down before packing or storage.

## Precaution for use

### Storage

1. Before opening the package: The LED should be kept at 30°C or less and 90%RH or less.
2. After opening the package: The LED's floor life is 168Hrs under 30°C or less and 60%RH or less. If unused LED remain, it should be stored in moisture proof packages JEDEC (MSL 3).
3. 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.