

# **SPECIFICATIONS FOR T3C SERIES**

## **WHITE LED**

**Model: 3030**  
**Part No: T3C50821S-\*\*\*\*\***

## Features:

- \* Top view white LED
- \* Thermally Enhanced Package Design
- \* High luminous flux output
- \* High current capability
- \* Compact Package Size
- \* Wide viewing angle
- \* Pb-free Reflow Soldering Application
- \* The product itself will remain within RoHS compliant version



## Applications

- \* Retrofits(replacement)
- \* General lighting
- \* Indoor & Outdoor sign board back light
- \* Architectural / Decorative lighting

**Part Numbering System**T                 -             

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	2700K:27; 3000K:30; 4000K:40; 5000K:50; 5700K:57; 6500K:65; RE:Red;GR:Green;BL:Blue;YE:Yellow; PA:PC Amver;IR: Infrared;
X3	Color Rendering	Ra70:7; Ra80:8; Ra90:9.
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;
X8	Internal code1	\
X9	Internal code2	\
X10	Spare code	\

**Electro Optical Characteristics, IF = 120mA, Tj=25°C**

CCT	Color Rendering	Red color rendering	Luminous Flux	
	Min.	Min.	Typ.	Min.
5000K	80	0	122	120

\* Tolerance of measurements of the Luminous Flux is  $\pm 7\%$ .\* Ra measurement tolerance is  $\pm 2$ .

**Absolute Maximum Ratings at Tj=25°C**

Item	Symbol	Absolute Maximum Rating	Unit
Forward current	IF	200	mA
Pulse Forward current	IFP	300	mA
Power Dissipation	PD	1200	mW
Reverse Voltage	VR	5	V
Operating Temperature	Topr	-40~+105	°C
Storage Temperature	Tstg	-40~+85	°C
Junction Temperature	Tj	120	°C
Soldering Temperature	Tsld	Reflow Soldering : 230°C or 260°C for 10sec	

\* IFP condition with Pulse: Width≤100μs, Duty cycle≤1/10.

\* 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.

**Electrical/Optical Characteristics at Tj=25°C**

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward Voltage	VF	5.6	5.9	6.0	V	IF = 120mA
Reverse Current	IR	-	-	10	μA	VR=5V
Viewing Angle	2θ1/2	-	120	-	°	IF = 120mA
Thermal Resistance	(Rth j-sp)	-	13	-	°C/W	IF = 120mA
Electrostatic Discharge	ESD	1000	-	-	V	HBM

\* Tolerance of measurements of the Forward Voltage is ±0.2V.

\* 2θ1/2 is the off-axis where the luminous intensity is 1/2 of the peak intensity.

\* Rth j-sp is the thermal resistance from LED junction to solder point on MCPCB with electrical power.

## Bin Structure

Luminous Flux Ranks, IF = 120mA, Tj =25°C

CCT	Color Rendering		Luminous Flux		
	Min.	Typ.	Code	Min	Max
5000K	80	82	5H	115	120
			5J	120	125
			5K	125	130
			5L	130	135

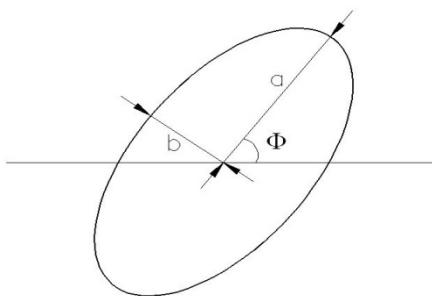
\* Tolerance of measurements of the Luminous Flux is  $\pm 7\%$ .

\* Ra measurement tolerance is  $\pm 2$ .

**Forward Voltage Ranks, IF = 120mA, Tj =25°C**

Code	Min	Max	Unit
Z3	5.6	5.8	V
A4	5.8	6.0	V
B4	6.0	6.2	V

\* Tolerance of measurements of the Forward Voltage is  $\pm 0.2V$ .

**CIE Chromaticity Diagram, IF = 120mA, Tj = 25°C**

**The color ranks have chromaticity ranges within 5-step MacAdam ellipse**

Color Code	Center		Radius		Angle(deg)
	x	y	a	b	
50AZ5	0.3533	0.3651	0.013700	0.005900	59.37

\* Tolerance of measurements of the chromaticity Coordinate is  $\pm 0.005$ .

## Kitting Rule of Reel for Shipment

### CIE kitting

CIE Kit	Reel 1	Reel 2
Kit 1	50AZ5	50AZ5

### Flux kitting

Im kit	Reel 1	Reel 2
Kit 1	5H	5K
Kit 2	5H	5L
Kit 3	5J	5J
Kit 4	5J	5K
Kit 5	5J	5L
Kit 6	5K	5K
Kit 7	5K	5L
Kit 8	5L	5L

### Vf kitting

Vf kit	Reel 1	Reel 2
Kit 1	Z3	Z3
Kit 2	Z3	A4
Kit 3	Z3	B4
Kit 4	A4	A4

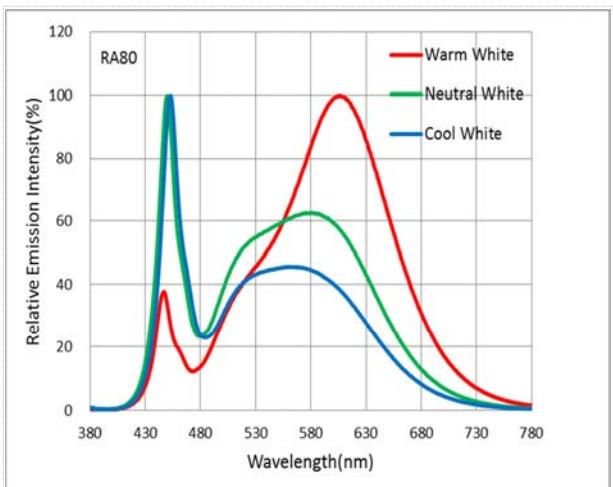
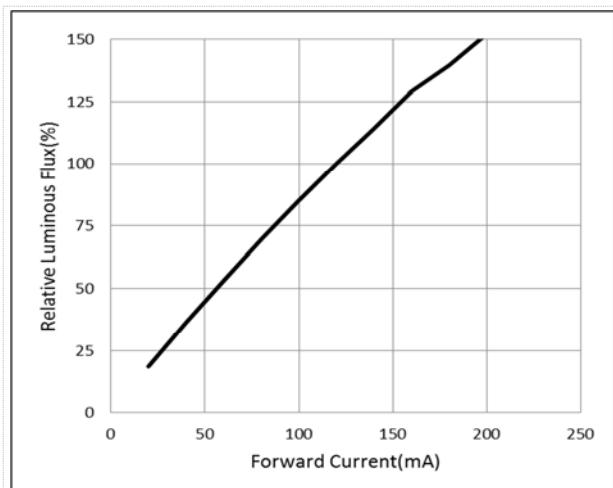
Fig 1. Color Spectrum,  $T_j = 25^\circ\text{C}$   $\text{Ra} \geq 80$ Fig3. Forward Current vs. Relative Intensity,  $T_j = 25^\circ\text{C}$ 

Fig 5. Ambient Temperature vs. Relative Luminous flux (IF=120mA)

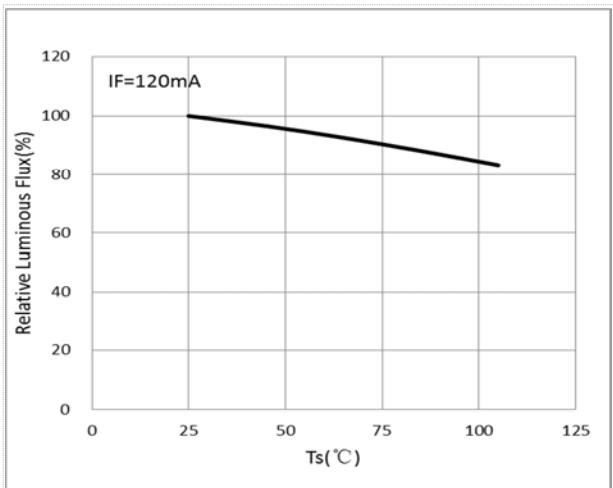
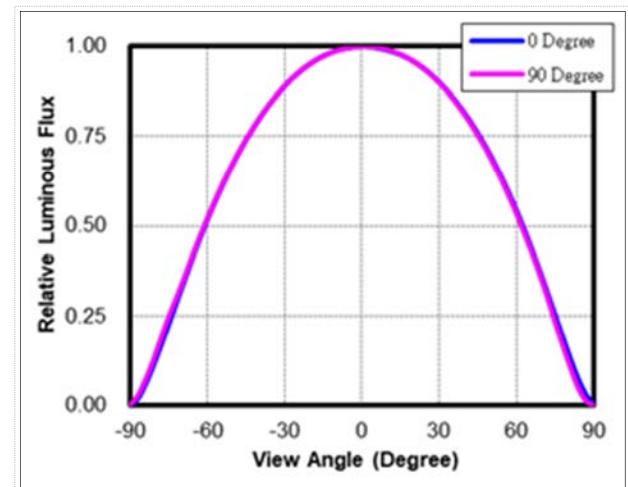
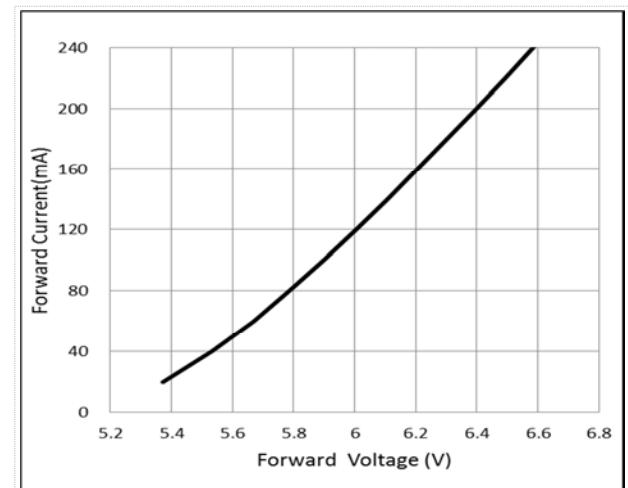
Fig 2. Viewing Angle Distribution,  $T_j = 25^\circ\text{C}$ Fig 4. Forward Current vs. Forward Voltage,  $T_j = 25^\circ\text{C}$ 

Fig 6. Ambient Temperature vs. Relative Forward Voltage (IF=120mA)

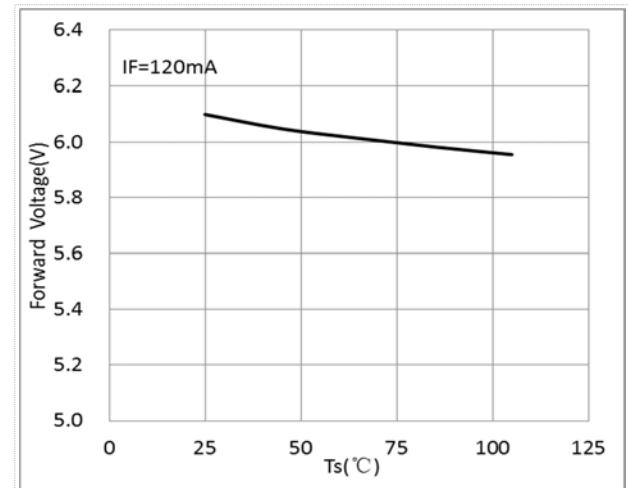


Fig 7. Ts vs. CIE x, y Shift

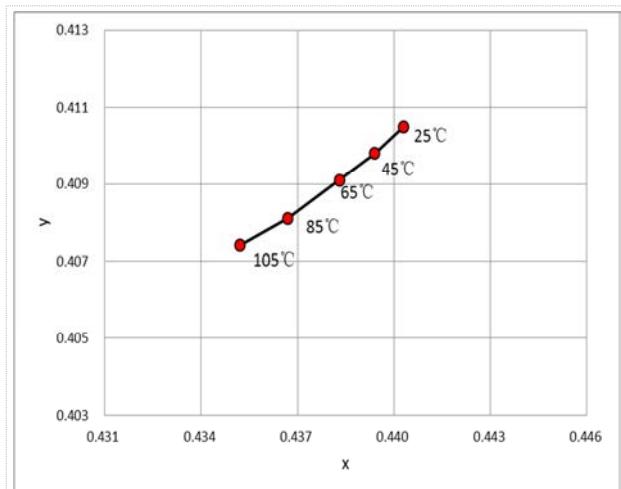
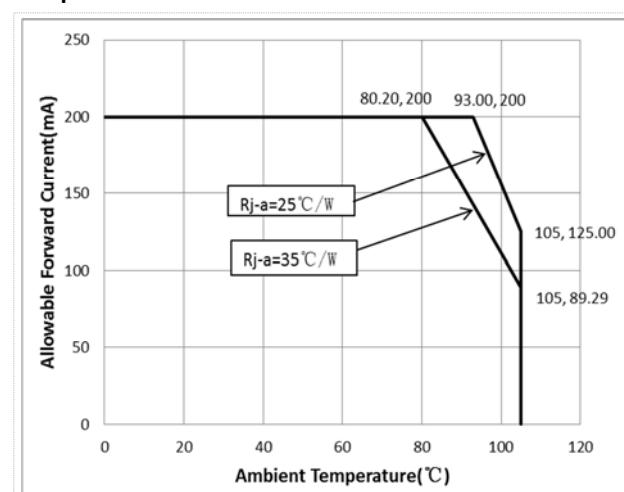
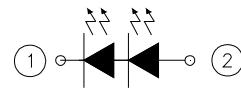
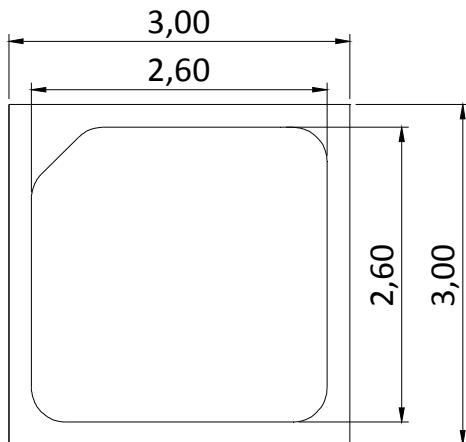


Fig8. Maximum Forward Current vs. Ambient Temperature

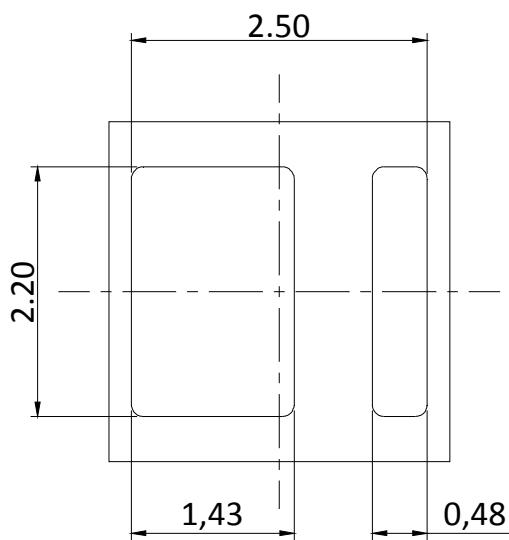
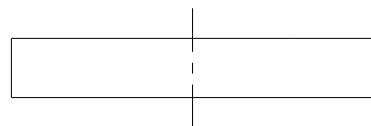
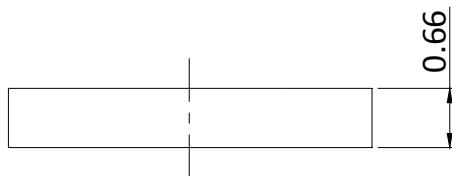


**Package Dimensions**

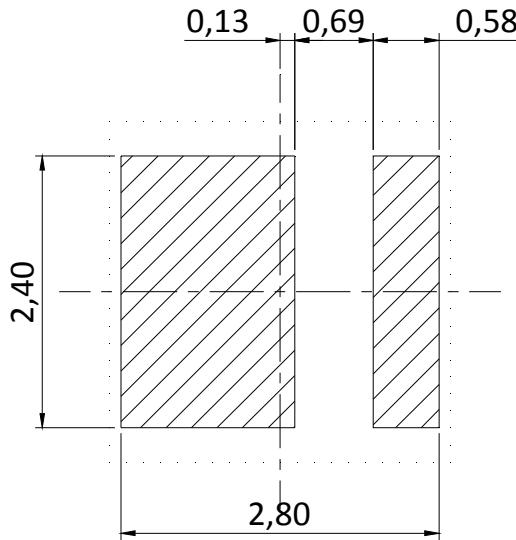
**Polarity**

①  
Cathode

②  
Anode



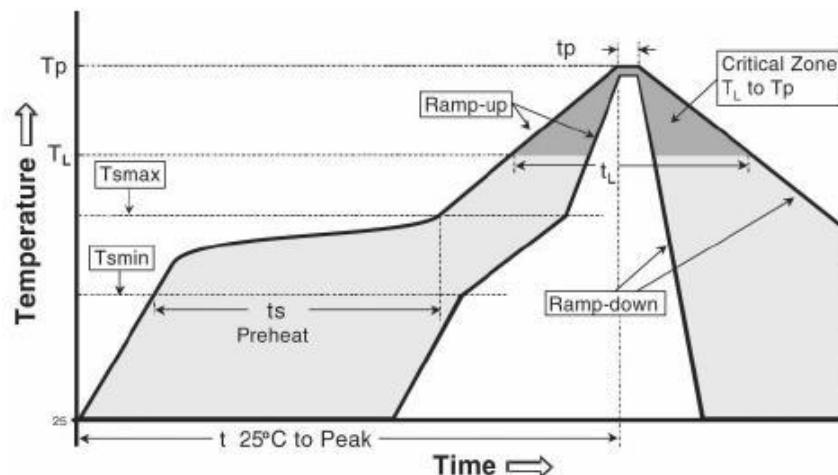
**Bot. view**



**Soldering patterns**

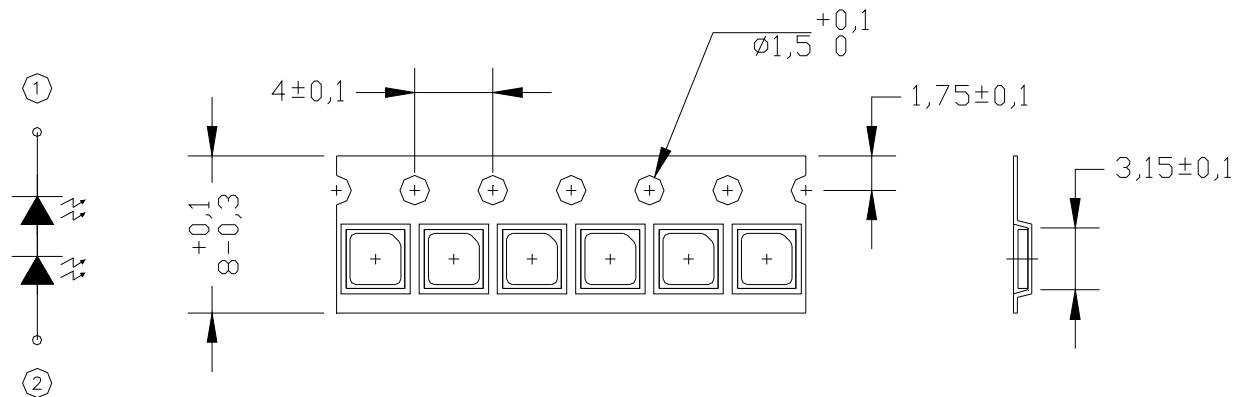
\* The tolerance unless mentioned is  $\pm 0.2\text{mm}$ , unit = mm

## Reflow Soldering Characteristics



Reflow soldering	
Temperature Min (Tsmin)	150° C
Temperature Max (Tsmax)	200° C
Time(ts)from ( Tsmin to Tsmax)	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



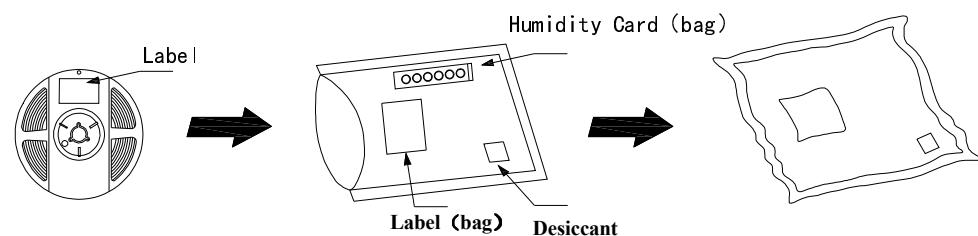
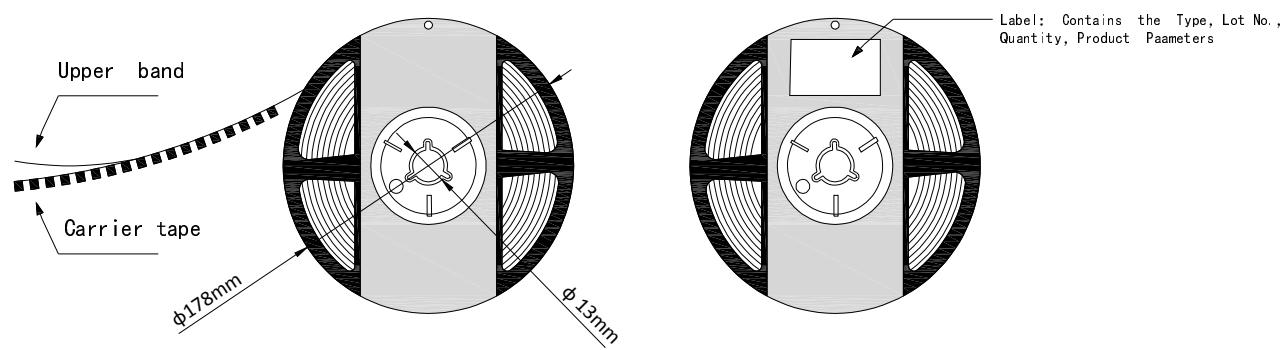
\* Quantity : Max 5000pcs/Reel

\* Cumulative Tolerance : Cumulative Tolerance/10 pitches to be  $\pm 0.2$ mm

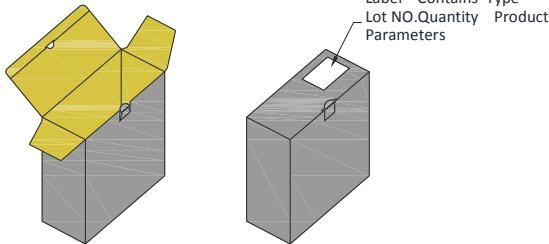
\* Package : P/N, Manufacturing data Code No. and Quantity to be indicated on a damp proof Package.

\* unit = mm

## Package Dimensions of Reel

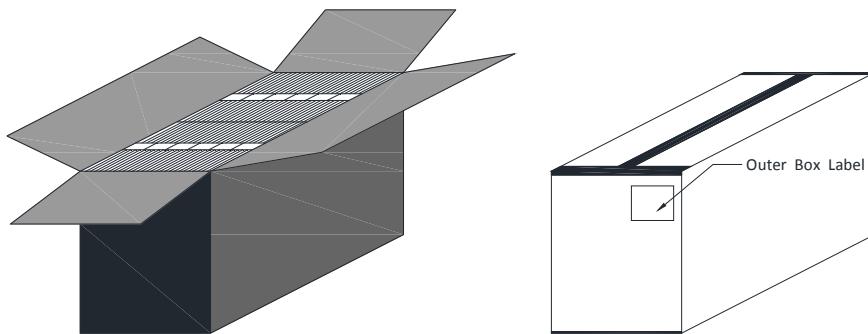


## Package Box



\* Capacity 10 reels per box.

## Outer Box



\* Capacity 30 or 60 reels per box.

## Label



## 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 EMC 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 5°C~30°C and 60%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.