

# PC33A18 V1

## Product Specification

## Approval Sheet

PC33A18 V1

Product Specification



<b>Product</b>	Yellow SMD LED
<b>Part Number</b>	PC33A18 V1
<b>Issue Date</b>	2018/12/25



### ■ Feature

- ✓ Yellow SMD LED (L x W x H) of 3.2 x 3.0 x 0.6 mm
- ✓ AEC-Q101 Rev. D and IEC 60810 qualification
- ✓ Dice Technology : InGaN
- ✓ Qualified according to JEDEC moisture sensitivity Level 2
- ✓ Cu Alloy with Gold plated lead frame
- ✓ Environmental friendly ; RoHS compliance
- ✓ ESD protection
- ✓ Packing : 1,000 / 2,000 / 3,000 pcs/reel

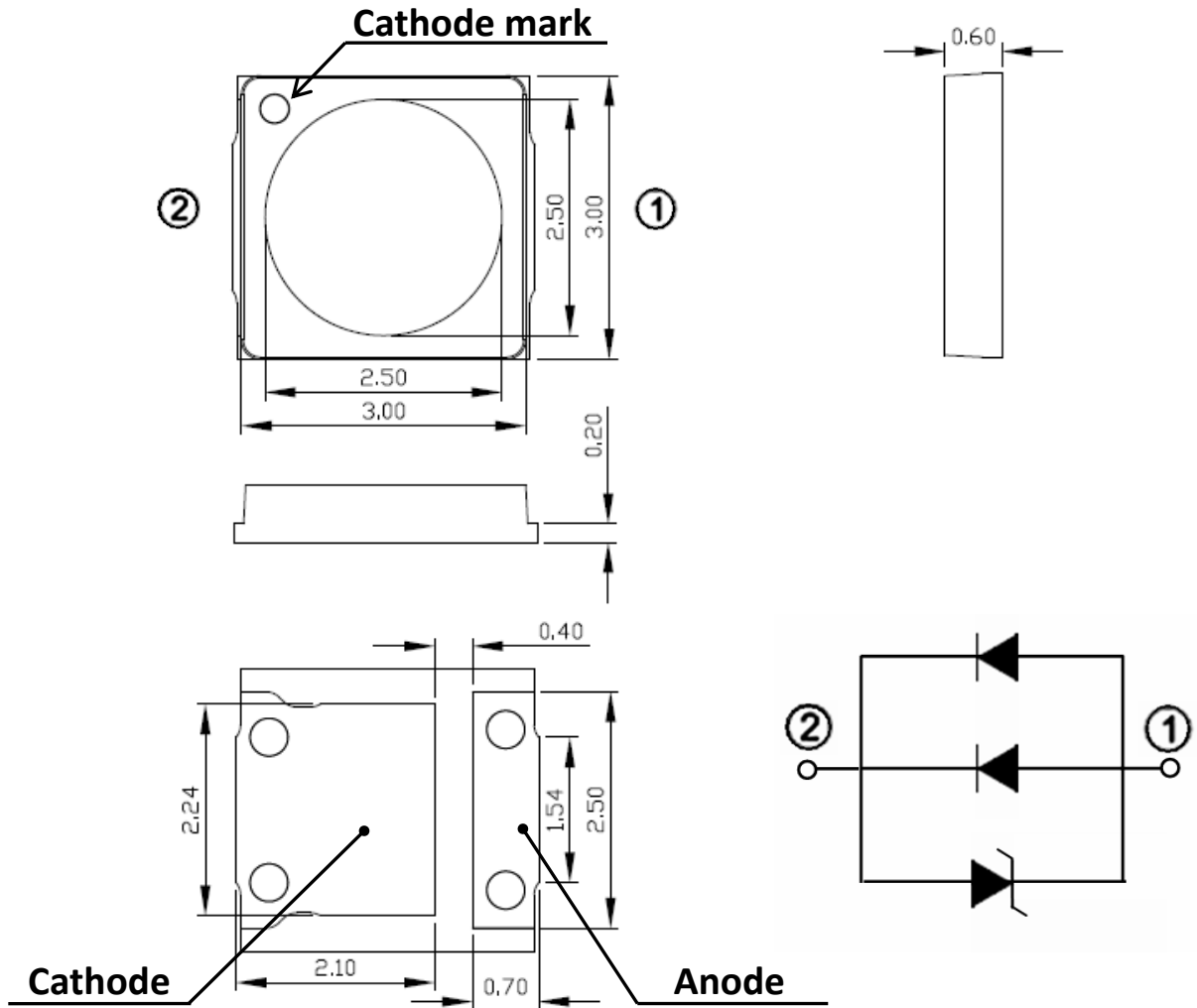
### ■ Applications

- ✓ Side turn indicator

## Outline Dimension

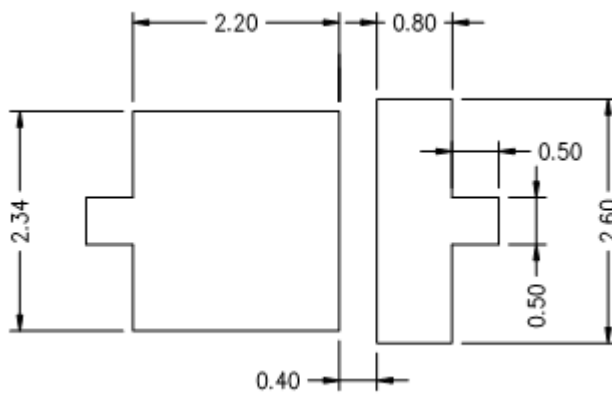
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Unit: mm, Tolerance:  $\pm 0.1\text{mm}$

### Recommended Soldering Pad



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

Performance

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■ Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage <sup>(1)</sup>	V <sub>F</sub>	I <sub>F</sub> = 350 mA	3.0	3.3	3.6	V
Luminous Flux	Φ <sub>V</sub>		72.7	88	117.2	lm
View Angle	θ		120			deg
Thermal Resistance	R <sub>th</sub>		20			°C/W

\* The Forward Voltage tolerance is ±0.05V

\* The luminous intensity tolerance is ± 8%

\* Tolerance of measurements of the Chromaticity Coordinate is ±0.005.

■ Absolute Maximum Ratings

Parameter	Symbol	value	Unit
DC Forward Current <sup>(1)</sup>	I <sub>F</sub>	450	mA
Power Dissipation	P <sub>D</sub>	1.6	W
Pulse Forward Current <sup>(2)</sup>	I <sub>FP</sub>	600	mA
Storage Temperature	T <sub>stg</sub>	-40 ~ +125	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +125	°C
Junction Temperature	T <sub>J</sub>	150	°C
ESD (HBM)	ESD <sub>HBM</sub>	8000	V
Assembly Temperature	T <sub>sld</sub>	260	°C

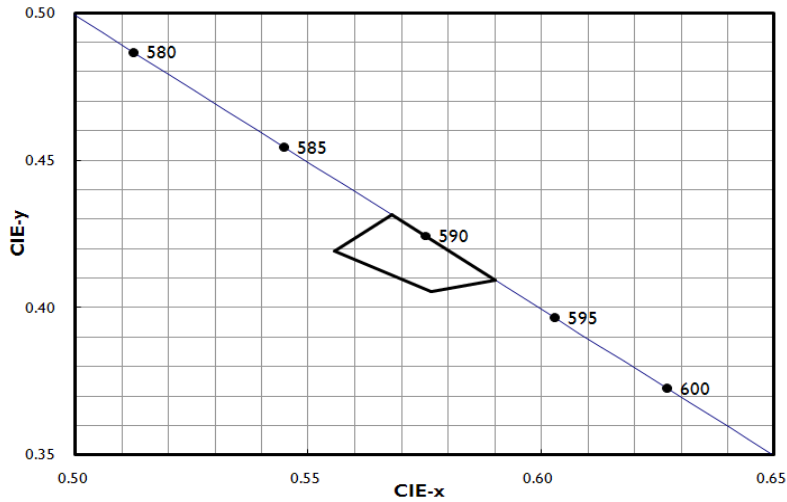
(1) Proper current rating must be observed to maintain junction temperature below maximum at all time

(2) IFP Condition: Duty 1/10, Pulse within 10msec

Binning

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**Chromaticity Coordinates**



**Bin code definition**

V <sub>F</sub> Rank	Luminous Flux Rank	CIE Rank
A	VT	A2000

V <sub>F</sub> Rank	Condition	Min. (V)	Max. (V)
A	I <sub>F</sub> = 350 mA T <sub>j</sub> = 25°C	3.0	3.2
B		3.2	3.4
C		3.4	3.6

Luminous Flux Rank	Condition	Min. (lm)	Max. (lm)
VS	I <sub>F</sub> = 350 mA T <sub>j</sub> = 25°C	72.7	80.0
VT		80.0	88.0
VU		88.0	96.8
VV		96.8	106.5
VW		106.5	117.2

\* The Forward Voltage tolerance is ±0.05V

\* The luminous intensity tolerance is ± 8%

\* Tolerance of measurements of the Chromaticity Coordinate is ±0.005.

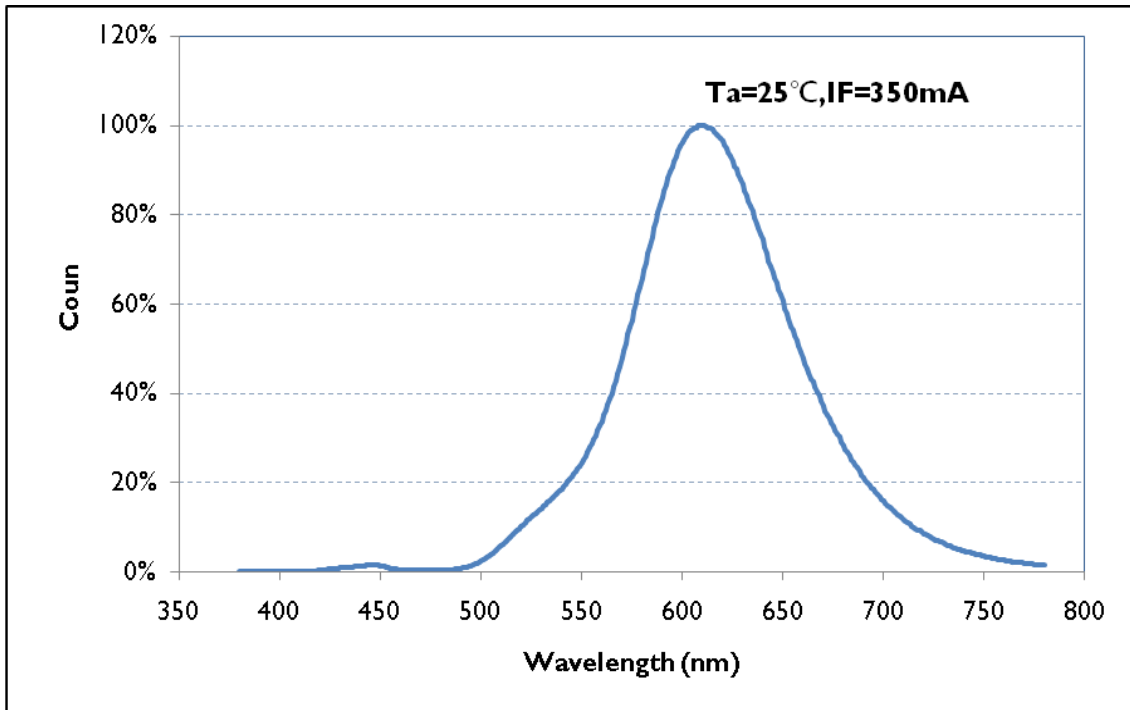
**CIE Rank**

CIE Rank	x1	y1	x2	y2	x3	y3	x4	y4
A2000	0.5680	0.4315	0.5901	0.4094	0.5763	0.4054	0.5557	0.4192

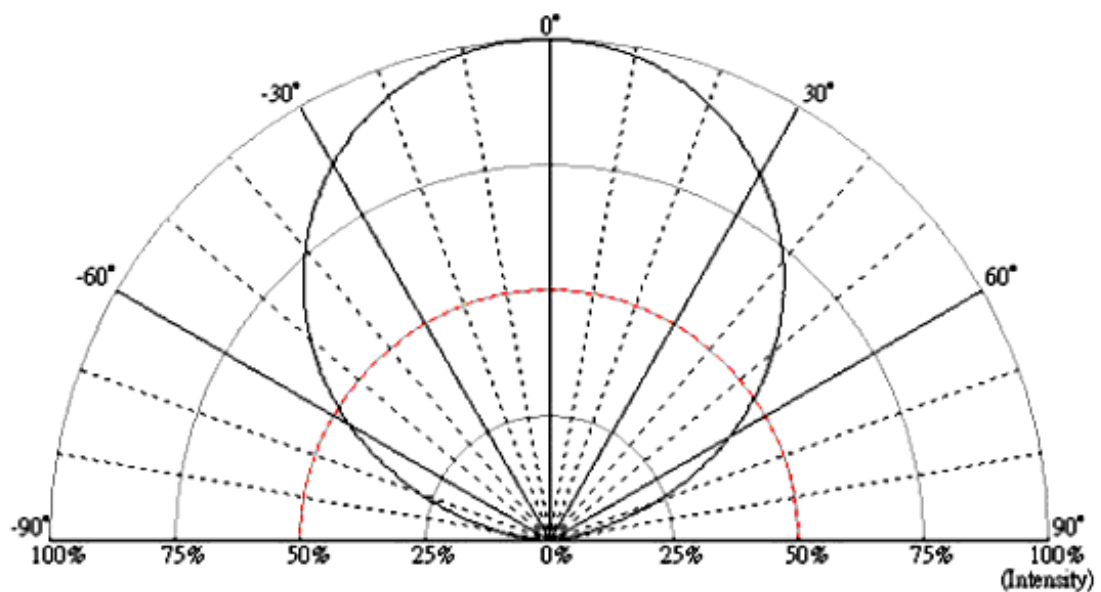
## Characteristics

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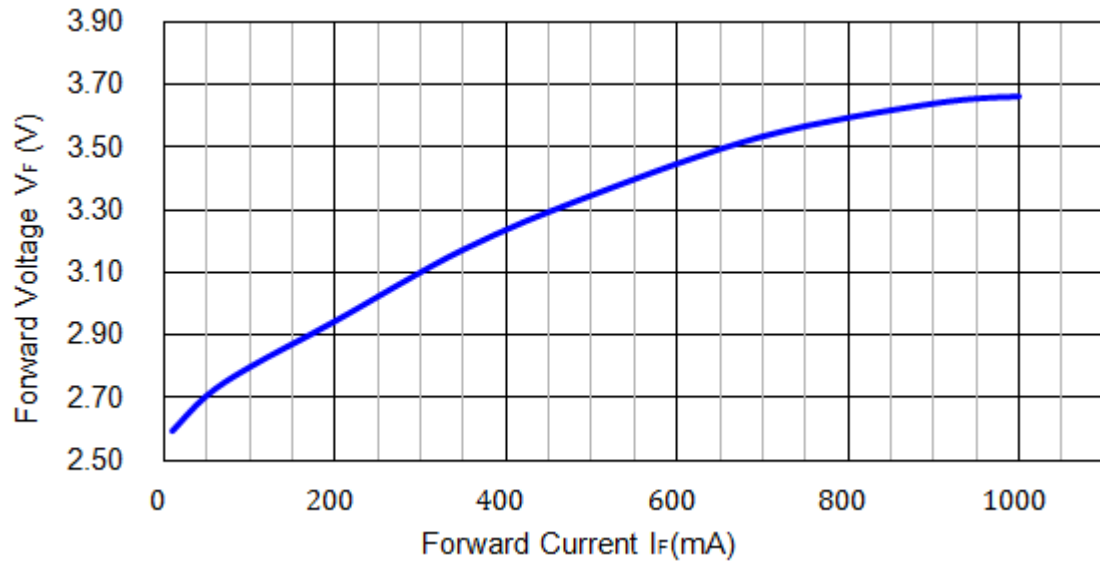
### Spectrum



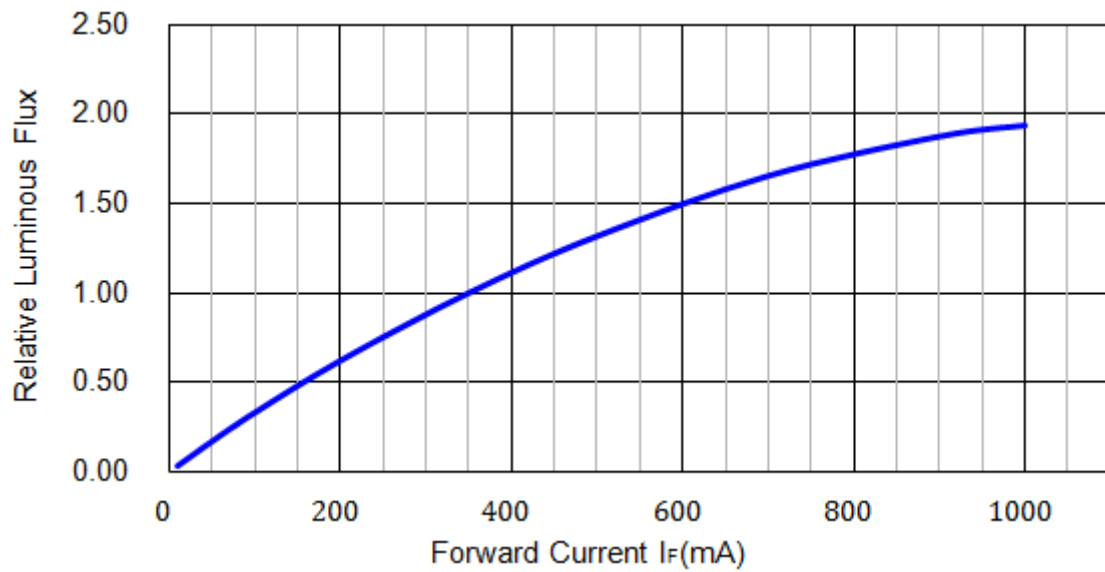
### Radiation Pattern



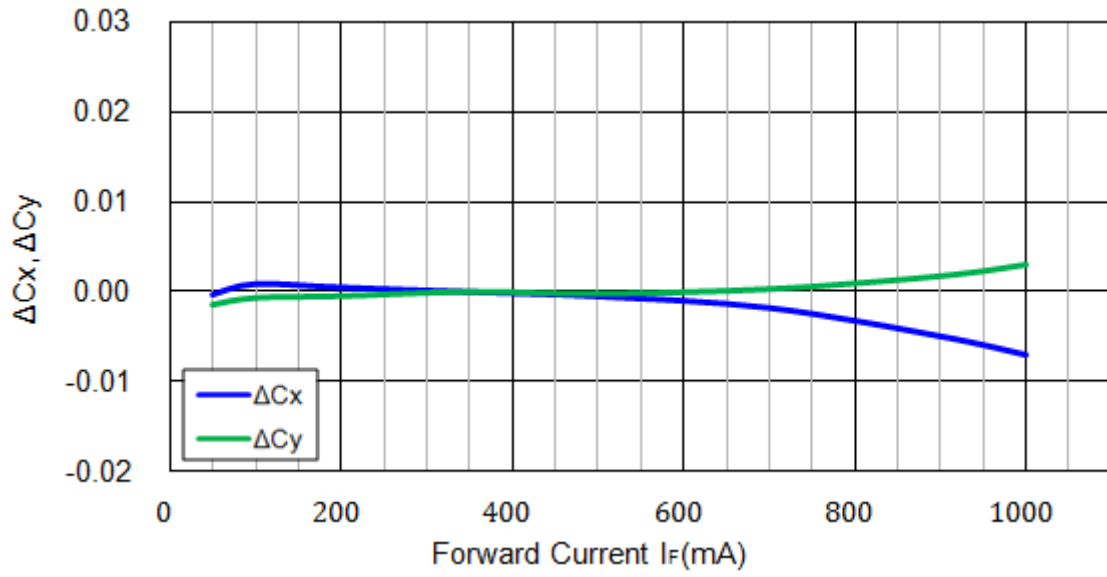
### ■ Forward Voltage vs. Forward Current



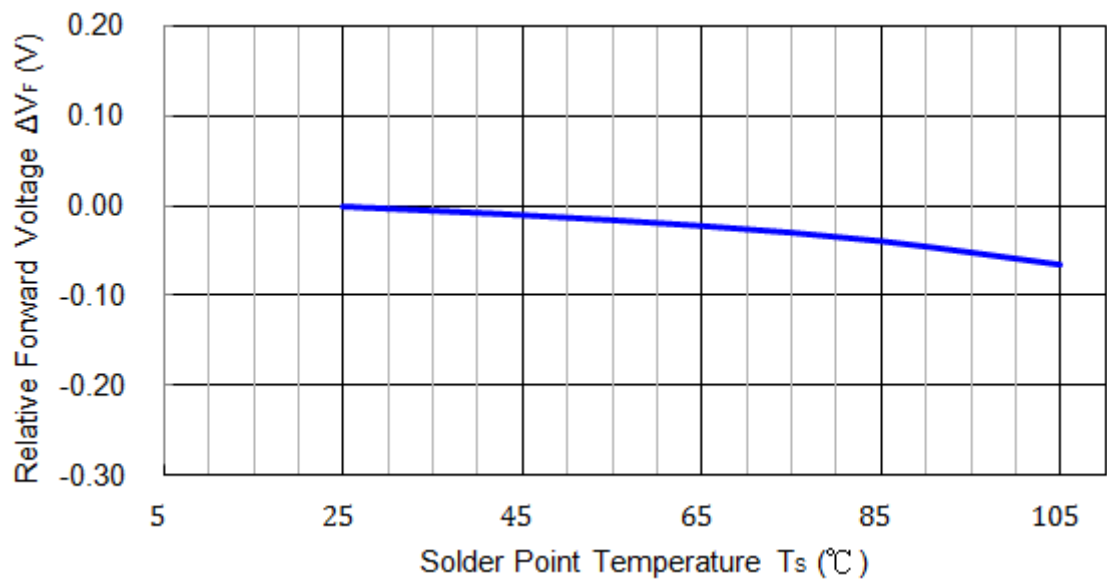
### ■ Forward Current vs. Relative Luminosity



### ■ Forward Current vs. Chromaticity Coordinate

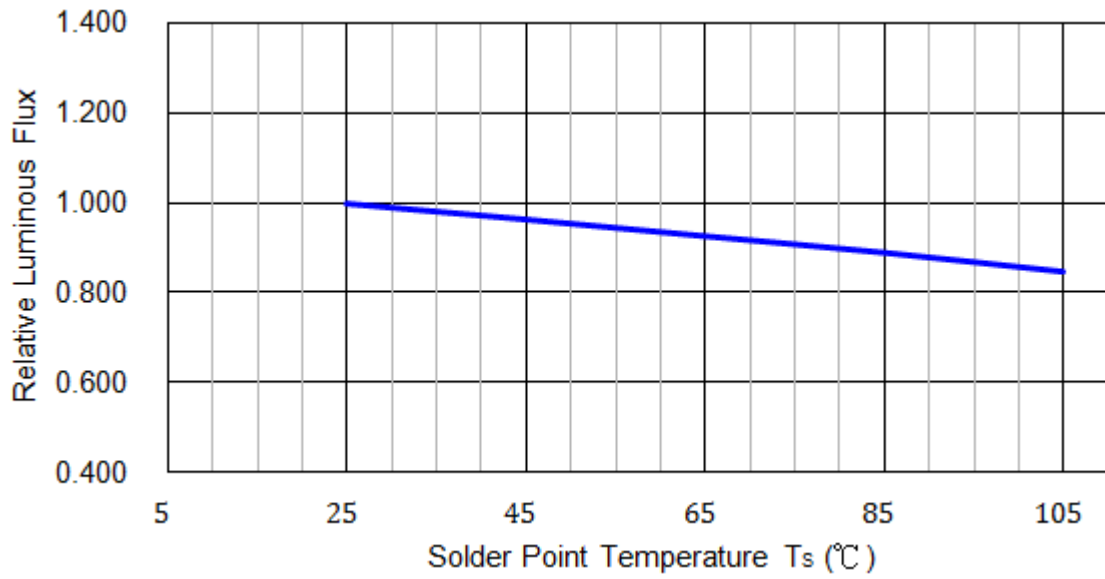


### ■ Relative Forward Voltage vs. Soldering Temperature

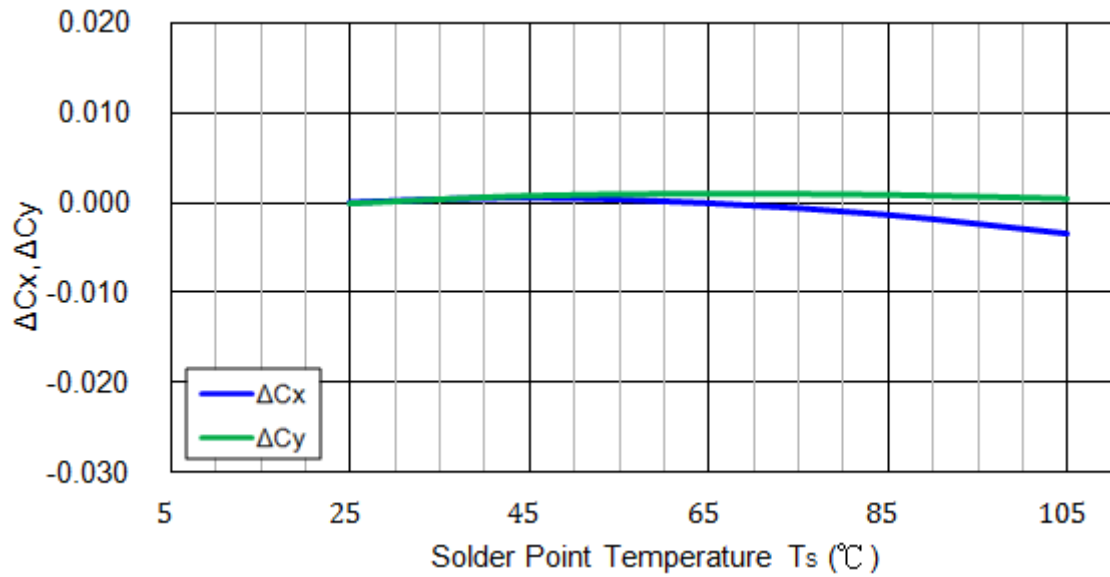




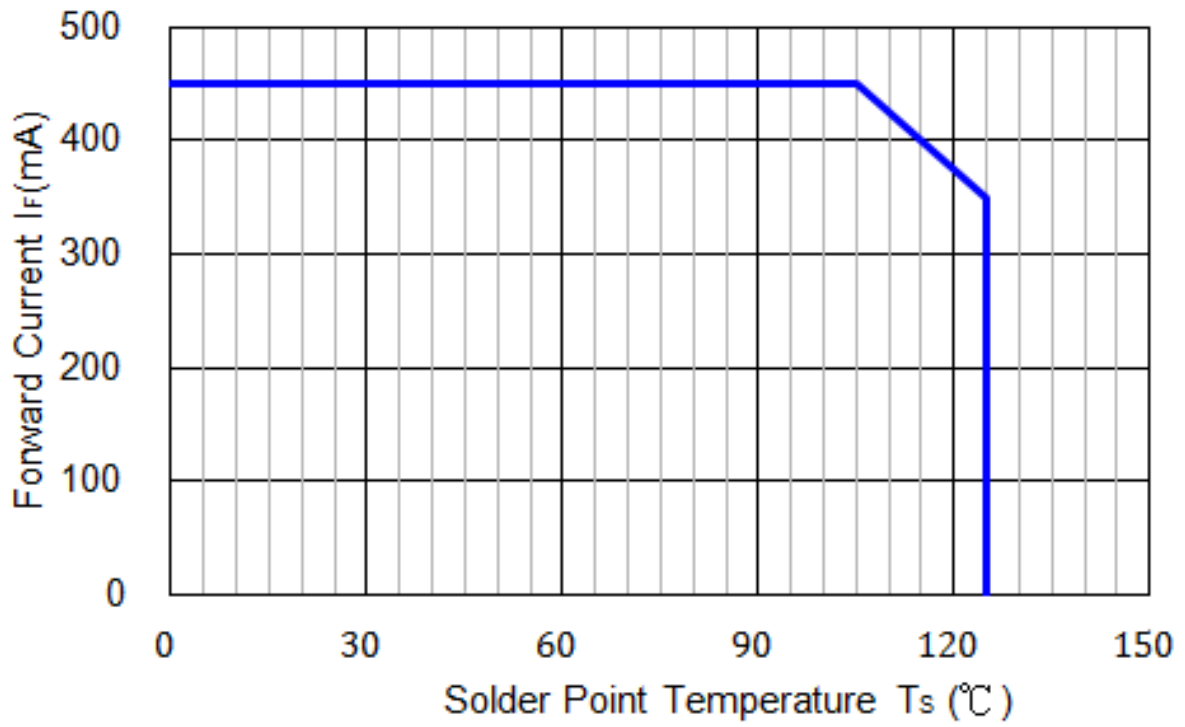
### ■ Relative Luminous Intensity vs. Soldering Temperature



### ■ Chromaticity vs. Soldering Temperature



■ De-rating Curve



**Reliability**

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**Reliability test**

	Item	Reference Standard	Condition	Time/Cycle
1	Thermal shock	JESD22-A106	-40°C to 125 °C, 20 mins dwell, 5 min transfer time	1000 Cycles
2	Temperature Cycle	AEC-Q101 Rev. D	-55°C to 125 °C 15 mins dwell at each high and low temperature extreme	1000 cycles
3	Power and Temperature Cycle	AEC-Q101 Rev. D	-40 °C~ 125 °C, IF=450mA, Dwell/transfer time = 10 mins, 20 mins 1,000 cycles , on/off 15,000 cycles	15,000 cycles
4	MSL Level 2	J-STD-020	85°C / 60% RH	168 hours
5	High Temperature Storage	JESD22-A103	TA=105°C, 1000hrs	1000 hours
6	Low Temperature Storage	JESD22-A119	TA=-40°C, 1000hrs	1000 hours
7	High Temperature Operating Life	AEC-Q101 Rev. D	TA=105°C, IF=450mA	1000 hours
8	Low Temperture Operating Life	JESD22-A108	TA=-40°C, IF=450mA	1000 hours
9	Temperature Humidity Operating Life	AEC-Q101 Rev. D	85°C, RH=85%, 1000hrs, IF=450mA	1000 hours
10	Electrostatic Discharges	AEC-Q101 Rev. D	HBM 8 KV, 1.5KΩ, 100pF, 3 pulses, alternately positive or negative	

Item	Reference Standard	Condition	Time
Corrosion robustness	IEC 60068-2-43	(H2S) [25°C / 75 %RH / 10 ppm H <sub>2</sub> S]	336 hours
	EN60068-2-60	[25 °C / 75 %RH / 200 ppb SO <sub>2</sub> , 200 ppb NO <sub>2</sub> ,10 ppb Cl <sub>2</sub> ]	504 hours

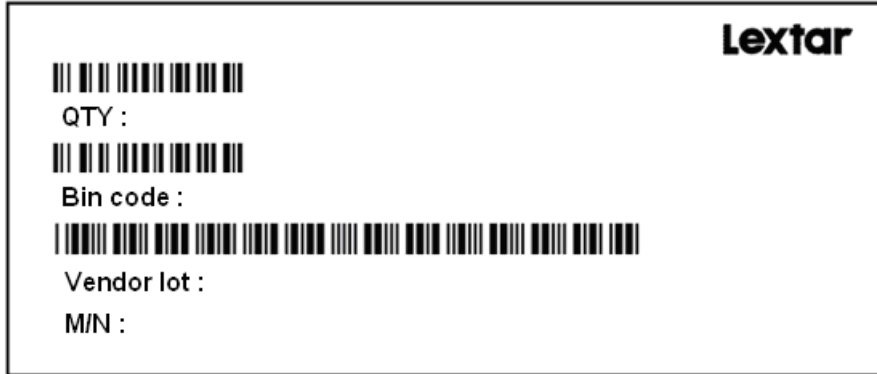
**Judgment Criteria**

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	V <sub>f</sub>	350mA	ΔV <sub>f</sub> < 10 %
Luminous Flux	I <sub>v</sub>	350mA	ΔI <sub>v</sub> < 20 %
Delta CIE	CIE-x ,CIE-y	350mA	Δx,y <0.01

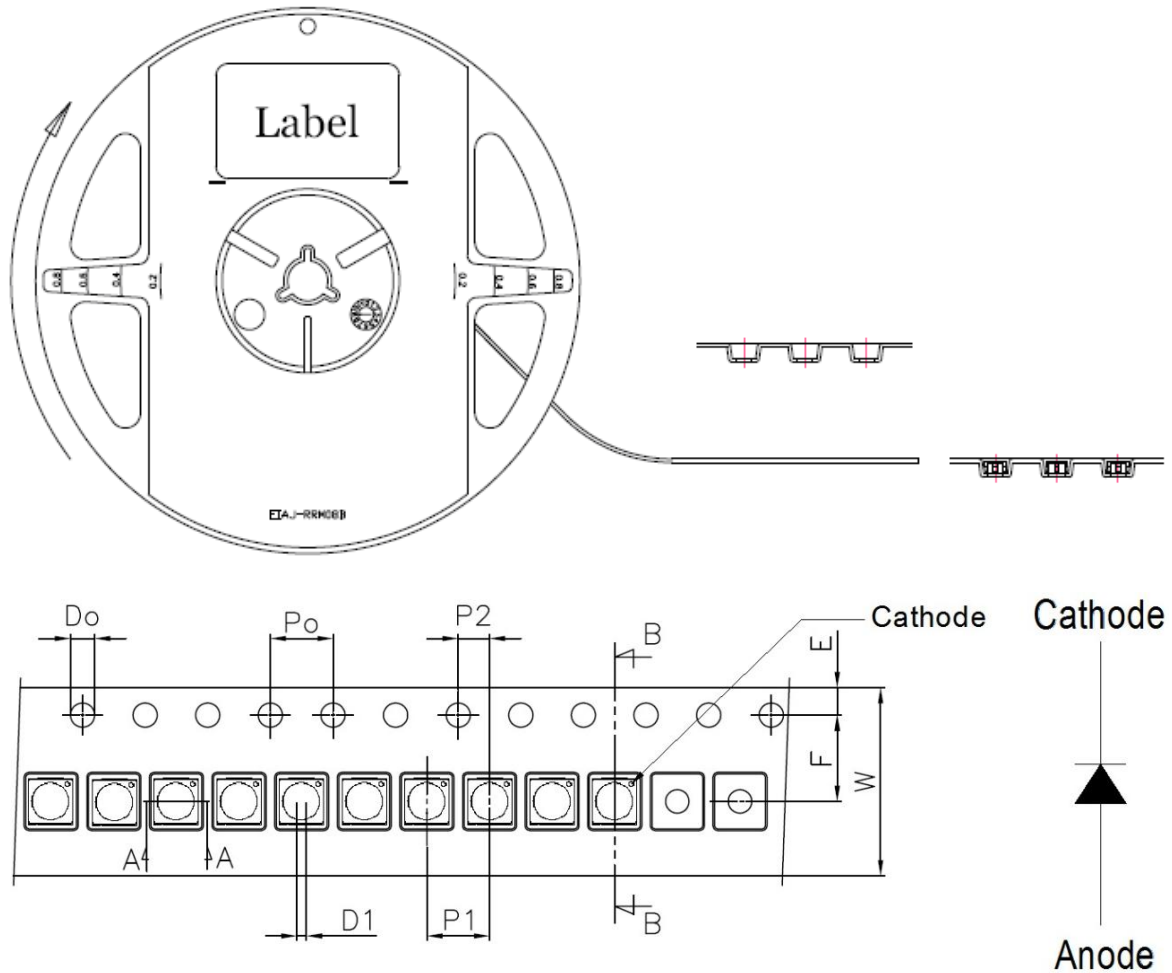
## Packing

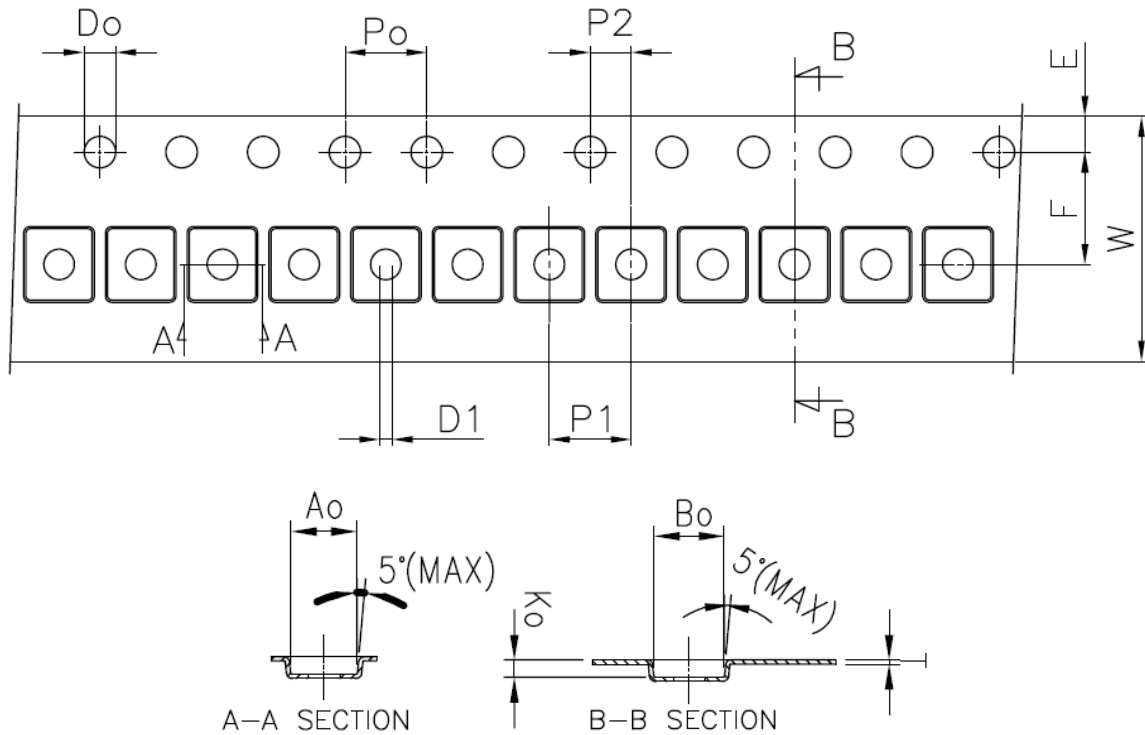
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### Label



### Carrier Taping





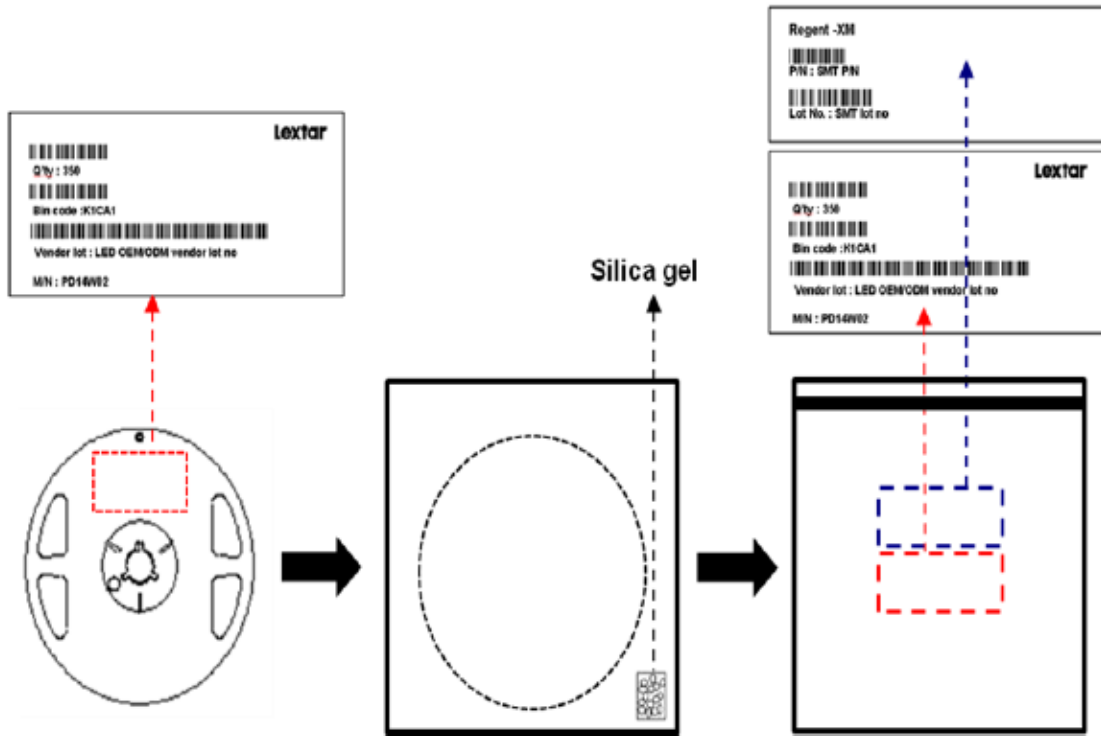
Unit:mm

symbol	Ao	Bo	Ko	Po	P1	P2	T
spec	3.25±0.10	3.50±0.10	0.78±0.10	4.00±0.10	4.00±0.10	2.00±0.05	0.20±0.05
symbol	E	F	Do	D1	W	10Po	
spec	1.75±0.10	5.50±0.05	1.50 <sup>+0.10</sup> <sub>0</sub>	1.50±0.10	12.0±0.30	40.00±0.20	

Notice:

1. 10 Sprocket hole pitch cumulative tolerance is  $\pm 0.20$ mm.
2. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
3. Ao & Bo measured on a place in the middle of the corner radii.
4. Ko measured from a place on the inside bottom of the pocket to top surface of carrier.
5. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
6. Surface resistivity  $10^4 \sim 10^8$  ohm/sq.

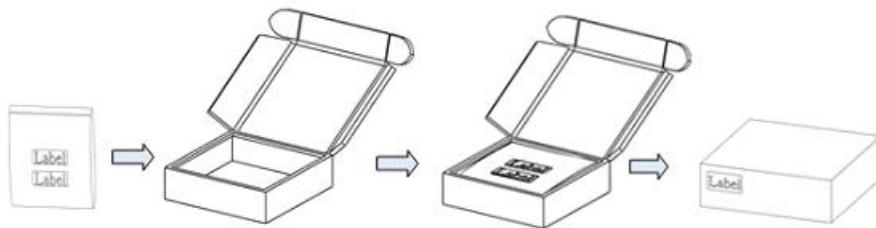
■ **Shield Bag Taping**



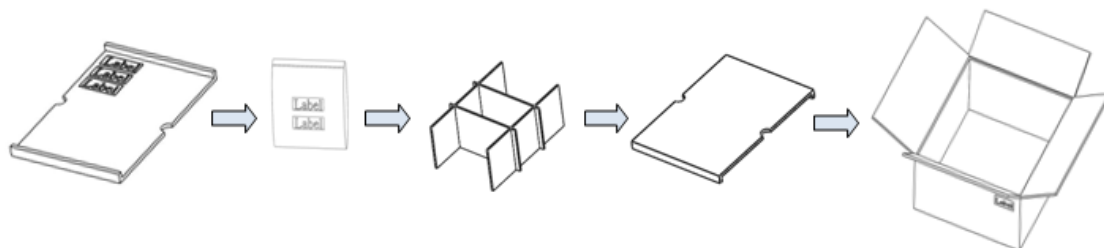
■ **Packing Box**

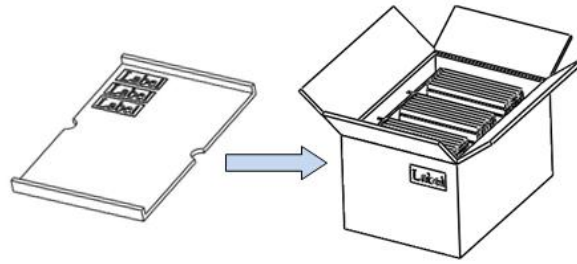
Type	Large Box		Medium Box		Small Box	
Dimension	541X511X276mm		385X303X260mm		283X235x70mm	
Maximum Reels	7"X12mm Reel	64/R	7"X12mm Reel	21/R	7"X12mm Reel	4/R
Minimum Reels	7"X12mm Reel	32/R	7"X12mm Reel	9/R	7"X12mm Reel	1/R

■ **Small Box**

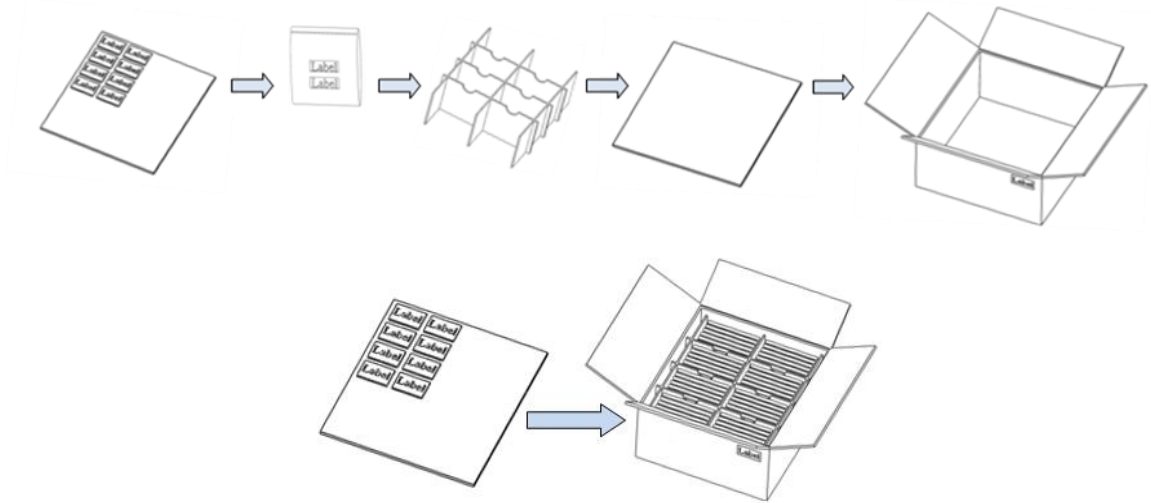


■ **Medium Box**





■ Large Box



## Precautions

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### ■ Safety Precautions

- The LED light output is too strong for human eyes without shield. Prevent eye contact directly more than seconds.
- Ensure operating under maximum rating.

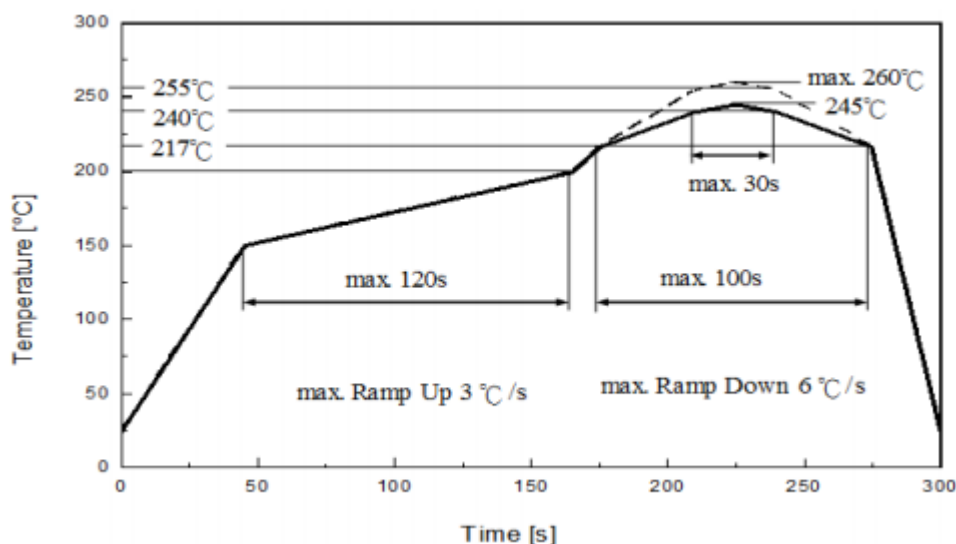
### ■ Storage

- Before opening the package, the LEDs should be kept at 40°C, 90% RH environment or less , and should be used within one year.
- After opening the package bag,  
The LEDs should be kept at 30°C, 60% RH environment or less.  
The LEDs should be soldered within 12 months ( 1 year ).  
If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel).
- If the package is over storage time, the LEDs should be pre-bake  $65 \pm 5$  °C / 12 hrs before use. (One time only).

### ■ Soldering Notice and Conditions

When soldering LEDs,

- Do not solder/reflow the same LED over two times.
- Reflow temperature profile as below: (lead-free solder)



Classification Reflow Profile (JEDEC J-STD-020D)



- When soldering, don't put stress on the LEDs
- After LEDs have been soldered, strongly recommend not to repair to keep the LEDs performance.

### ■ Static Electricity

- LED package is extremely sensitive to static electricity. It's recommended that anti-electrostatic glove and wrist band is necessary when handling the LEDs. All devices are also be grounded properly as well.
- Protection devices design should be considered in the LED driving circuit.

### ■ Cleaning

- If washing is required, recommend to use alcohol as a solvent.
- Recommend to avoid cleaning the LEDs by ultrasonic. If necessary, pre-test the LED is necessary to confirm whether any damage occur after the process.

## Revision History

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Date	Contents	Writer	Approved
2017.10.31	Preliminary version	Rudess	Bemore
2018.02.08	Add Rth – P.4	Rudess	Bemore
2018.05.11	LED placed into carrier tape definition – P.11	Rudess	Bemore
2018.09.10	Update Recommended Soldering Pad – P.3	Rudess	Bemore
2018.12.25	Final version 1. update Absolute Maximum Ratings (Tj 150°C) – P.4 2. update Characteristics – P.7~10	Rudess	Bemore

## *Smart Lighting Amazing Life*

Lextar Electronics Corp. is the leading LED (Light Emitting Diode) maker integrating upper stream epitaxial, middle stream chip, and downstream package, SMT and LED lighting applications. Founded in May, 2008, Lextar is a subsidiary of AU Optronics, the leading TFT-LCD and solar PV manufacturer. Lextar's product applications include lighting and LCD backlight. Lextar's manufacturing sites include Hsinchu and Chunan in Taiwan, and Suzhou in China. The company turnover in 2010 is 266 million USD.