



**PC35N33 V0 Preliminary**  
**Product Specification**

## Approval Sheet

PC35N33 V0  
Product Specification



<b>Product</b>	White SMD LED
<b>Part Number</b>	PC35N33 V0
<b>Issue Date</b>	2018/05/28



### ■ Features

- ✓ White SMD LED (L x W x H) of 3.5 x 2.8 x 1.9 mm
- ✓ AEC-Q101 Rev. D and IEC 60810 qualification
- ✓ Dice Technology : GaN
- ✓ Qualified according to JEDEC moisture sensitivity Level 2
- ✓ Environmental friendly ; RoHS compliance
- ✓ ESD protection
- ✓ Packing : 2,000 or 1,000 pcs/reel

### ■ Applications

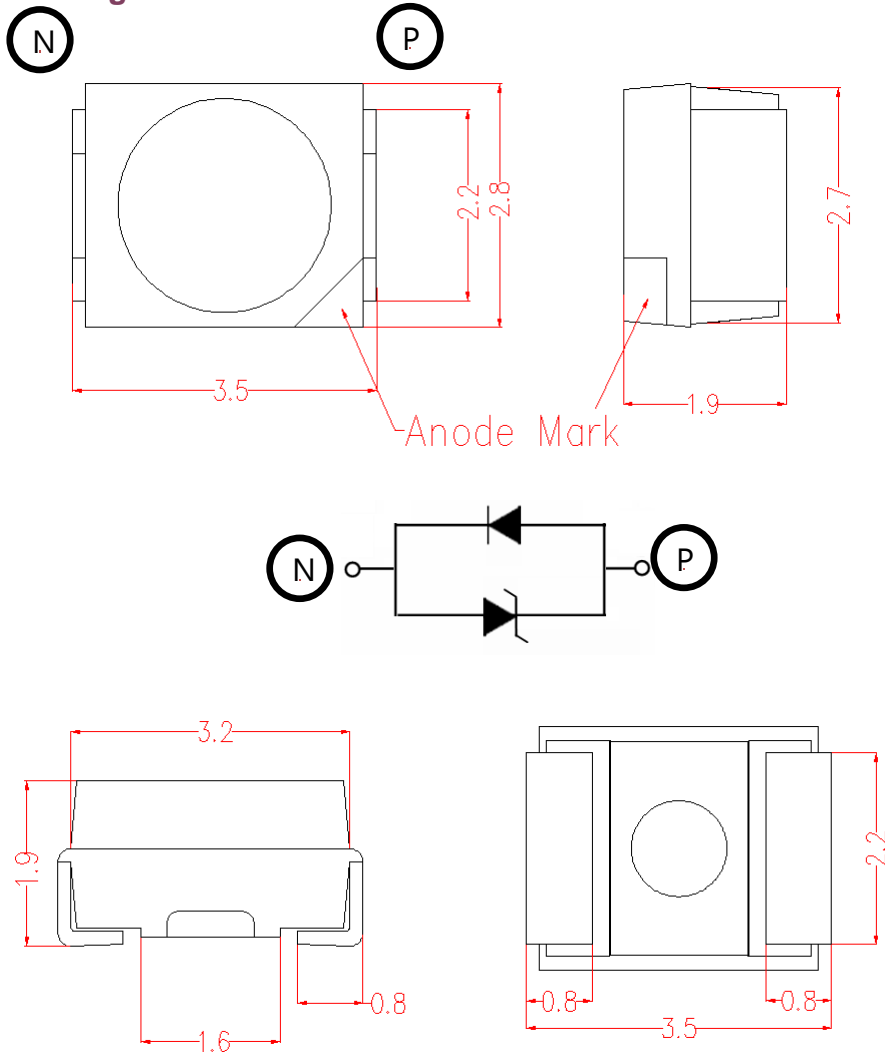
- ✓ Automotive Interior Lighting
- ✓ Signal and Symbol Luminary
- ✓ Backlighting
- ✓ Switches

## Outline Dimension

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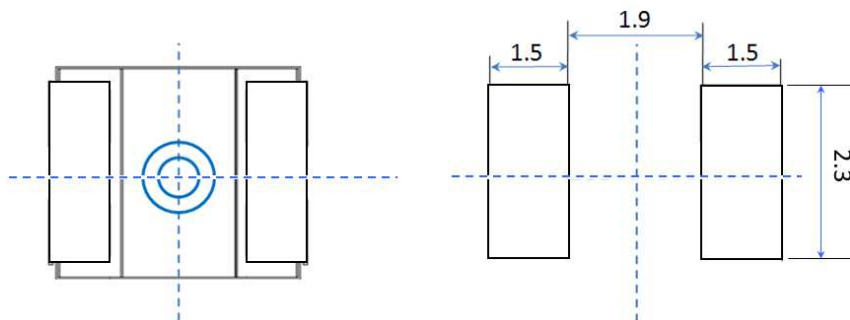
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### Package Dimension



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

### Recommended Soldering Pad



Performance

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	$V_F$	$I_F = 20 \text{ mA}$	2.8	3.0	3.4	V
Luminous Flux	$I_v$		1120	1600	2800	mcd
View Angle	$\theta$		120			deg
Thermal Resistance	$R_{th}$		100			°C/W

\* The Forward Voltage tolerance is  $\pm 0.05\text{V}$

\* The luminous intensity tolerance is  $\pm 8\%$

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

■ Absolute Maximum Ratings

Parameter	Symbol	value	Unit
DC Forward Current <sup>(1)</sup>	$I_F$	30	mA
Power Dissipation	$P_D$	0.062	W
Pulse Forward Current <sup>(2)</sup>	$I_{FP}$	50	mA
Storage Temperature	$T_{stg}$	-40 ~ +105	°C
Operating Temperature	$T_{opr}$	-40 ~ +105	°C
Junction Temperature	$T_J$	125	°C
ESD (HBM)	$ESD_{HBM}$	8000	V
Assembly Temperature	$T_{sld}$	260	°C

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

(2) IFP Condition: Duty 5/1000, Pulse within 10 us

## Binning

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### Bin code Definition

V <sub>F</sub> Rank	Luminous Flux Rank	CIE Rank
B	BA	KL0

### Forward Voltage Definition Group

V <sub>F</sub> Rank	Condition	Min. (V)	Max. (V)
A	I <sub>F</sub> = 20 mA T <sub>j</sub> =25°C	2.80	3.00
B		3.00	3.20
C		3.20	3.40

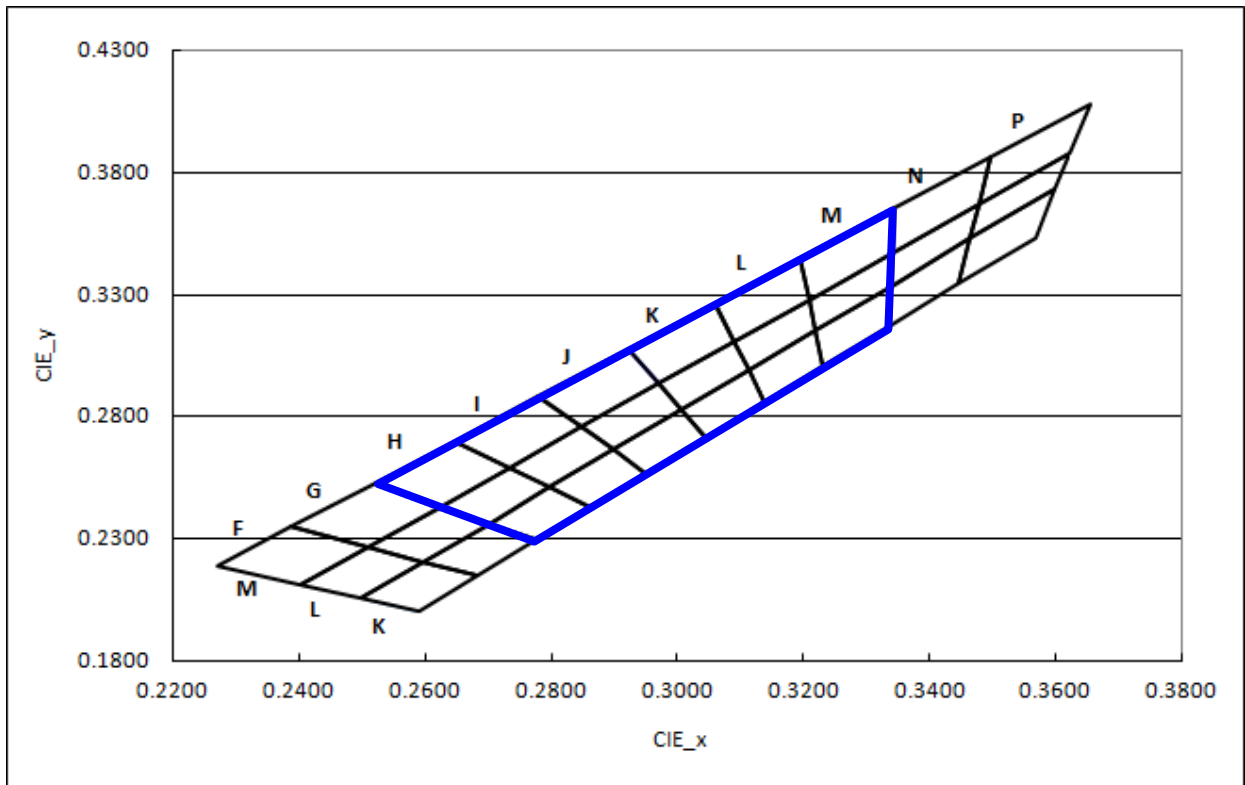
### Luminous Intensity Definition Group

Luminous Intensity Rank	Condition	Min. I <sub>v</sub> (mcd)	Max. I <sub>v</sub> (mcd)
AA	I <sub>F</sub> = 20 mA T <sub>j</sub> =25°C	1120	1400
AB		1400	1800
BA		1800	2240
BB		2240	2800

### CIE Rank

BinCode	CIE_x	CIE_y	BinCode	CIE_x	CIE_y	BinCode	CIE_x	CIE_y
FK0	0.2589	0.2000	FL0	0.2498	0.2053	FM0	0.2388	0.2348
	0.2498	0.2053		0.2402	0.2108		0.2269	0.2185
	0.2597	0.2204		0.2509	0.2264		0.2402	0.2108
	0.2682	0.2146		0.2597	0.2204		0.2509	0.2264
GK0	0.2682	0.2146	GL0	0.2597	0.2204	GM0	0.2509	0.2264
	0.2597	0.2204		0.2509	0.2264		0.2388	0.2348
	0.2700	0.2361		0.2624	0.2431		0.2520	0.2527
	0.2775	0.2292		0.2700	0.2361		0.2624	0.2431
HK0	0.2775	0.2292	HL0	0.2700	0.2361	HM0	0.2624	0.2431
	0.2700	0.2361		0.2624	0.2431		0.2520	0.2527
	0.2797	0.2509		0.2733	0.2590		0.2646	0.2700
	0.2861	0.2427		0.2797	0.2509		0.2733	0.2590

IK0	0.2861	0.2427	ILO	0.2797	0.2509	IMO	0.2733	0.2590
	0.2797	0.2509		0.2733	0.2590		0.2646	0.2700
	0.2898	0.2664		0.2848	0.2757		0.2780	0.2883
	0.2950	0.2568		0.2898	0.2664		0.2848	0.2757
JK0	0.2950	0.2568	JLO	0.2898	0.2664	JMO	0.2848	0.2757
	0.2898	0.2664		0.2848	0.2757		0.2780	0.2883
	0.3007	0.2830		0.2971	0.2935		0.2922	0.3077
	0.3045	0.2717		0.3007	0.2830		0.2971	0.2935
KK0	0.3045	0.2717	KLO	0.3007	0.2830	KMO	0.2971	0.2935
	0.3007	0.2830		0.2971	0.2935		0.2922	0.3077
	0.3113	0.2992		0.3090	0.3108		0.3060	0.3266
	0.3138	0.2862		0.3113	0.2992		0.3090	0.3108
LK0	0.3138	0.2862	LLO	0.3113	0.2992	LMO	0.3090	0.3108
	0.3113	0.2992		0.3090	0.3108		0.3060	0.3266
	0.3219	0.3154		0.3209	0.3281		0.3196	0.3451
	0.3231	0.3008		0.3219	0.3154		0.3209	0.3281
MK0	0.3339	0.3336	MLO	0.3341	0.3472	MMO	0.3345	0.3654
	0.3219	0.3154		0.3209	0.3281		0.3196	0.3451
	0.3231	0.3008		0.3219	0.3154		0.3209	0.3281
	0.3335	0.3172		0.3339	0.3336		0.3341	0.3472
NK0	0.3339	0.3336	NLO	0.3341	0.3472	NMO	0.3345	0.3654
	0.3335	0.3172		0.3339	0.3336		0.3341	0.3472
	0.3447	0.3347		0.3465	0.3530		0.3479	0.3673
	0.3465	0.3530		0.3479	0.3673		0.3498	0.3863
PK0	0.3465	0.3530	PLO	0.3479	0.3673	PMO	0.3498	0.3863
	0.3447	0.3347		0.3465	0.3530		0.3479	0.3673
	0.3567	0.3535		0.3599	0.3735		0.3623	0.3882
	0.3599	0.3735		0.3623	0.3882		0.3655	0.4079

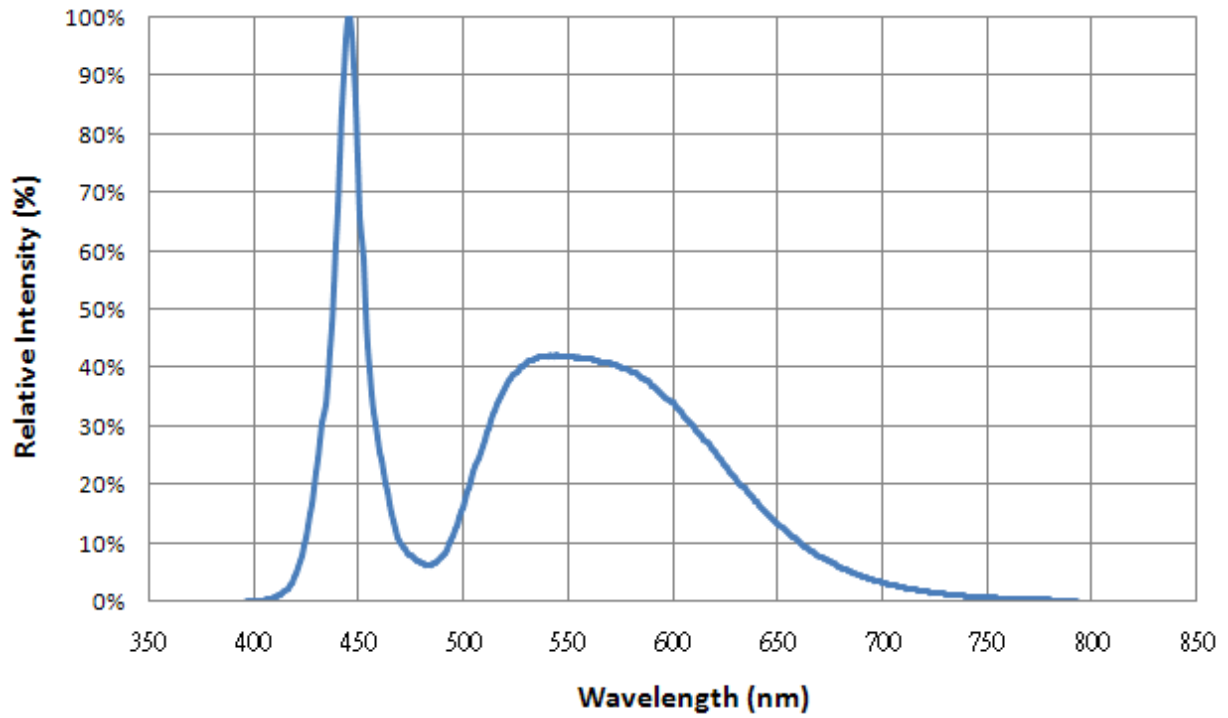


- \* The luminous flux tolerance is  $\pm 8\%$
- \* The Forward Voltage tolerance is  $\pm 0.05V$
- \* Tolerance of measurements of the Chromaticity Coordinate is  $\pm 0.005$ .

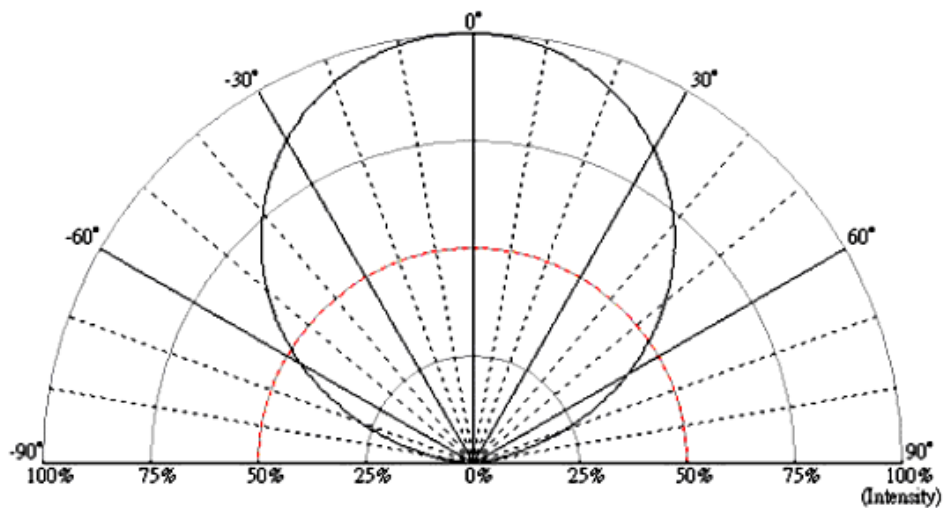
## Characteristics

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### Spectrum

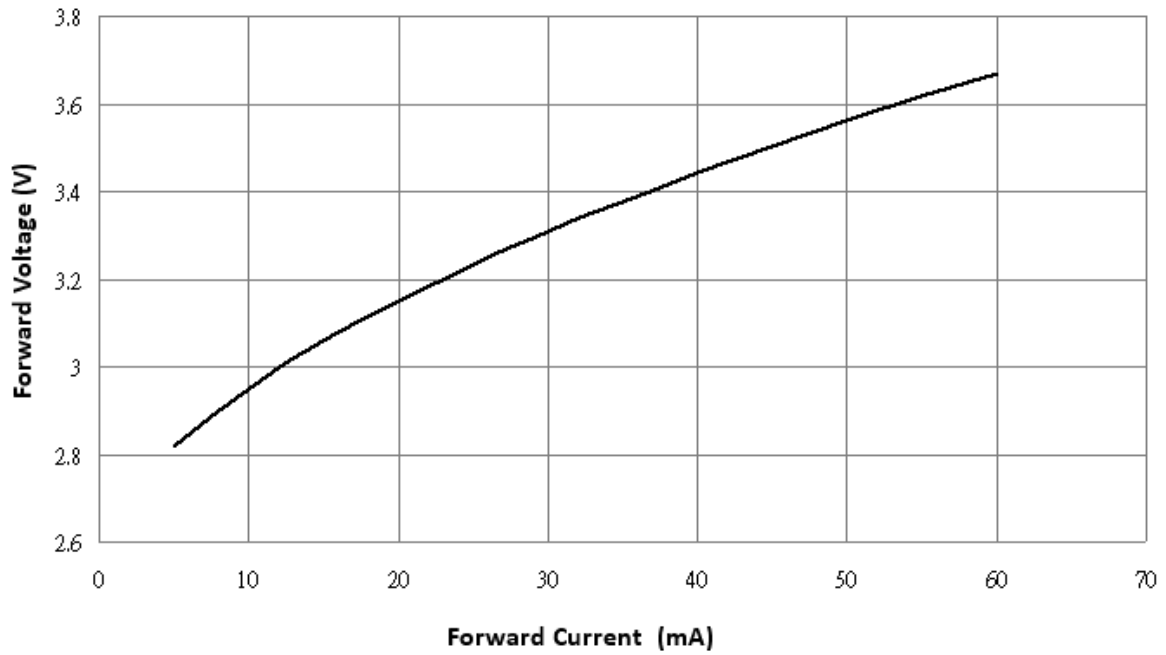


### Radiation Pattern

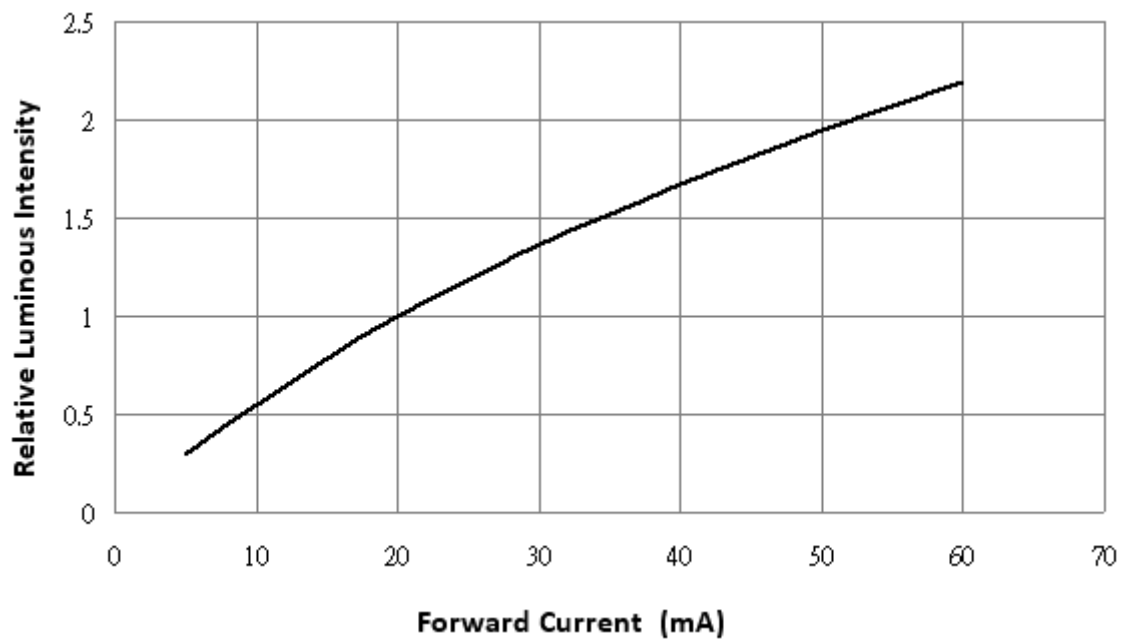




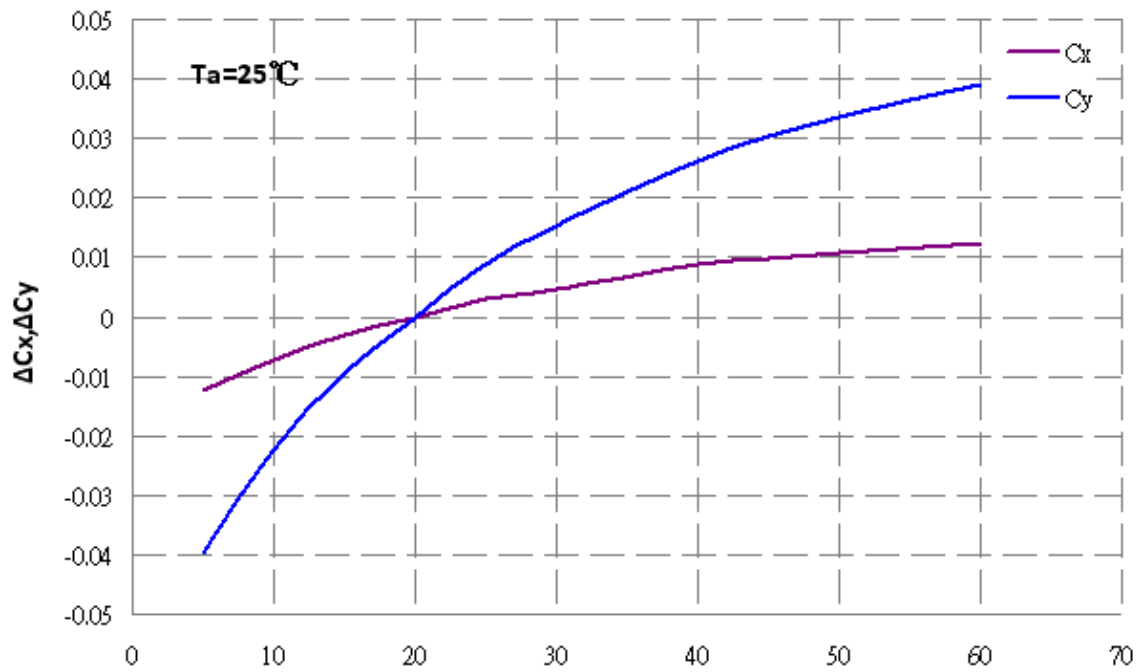
■ **Forward Voltage vs. Forward Current, Ta=25°C**



■ **Forward Current vs. Relative Luminous Intensity, Ta=25°C**



■ Forward Current vs. Relative CIE coordinate, Ta=25°C



Reliability

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■ Reliability test

	Item	Reference Standard	Condition	Time/Cycle
1	Thermal shock	JESD22-A106	-40°C to 100 °C, 20 mins dwell, 5 min transfer time	1000 Cycles
2	Power and Temperature Cycle	AEC-Q101 Rev. D	-40 °C~ 85 °C, IF=30mA, Dwell/transfer time = 10 mins, 20 mins 1,000 cycles , on/off 15,000 cycles	15,000 cycles
3	MSL Level 2	J-STD-020	85°C / 60% RH	168 hours
4	High Temperature Storage	JESD22-A103	TA=105°C, 1000h	1000 hours
5	Low Temperature Storage	JESD22-A119	TA=-40°C, 1000h	1000 hours
6	High Temperature Operating Life	AEC-Q101 Rev. D	TA=105°C, IF=30mA	1000 hours
7	Low Temperature Operating Life	JESD22-A108	TA=-40°C, IF=30mA	1000 hours
8	Temperature Humidity Operating Life	AEC-Q101 Rev. D	85°C, RH=85%, 1000h, IF=30mA	1000 hours
9	Electrostatic Discharges	AEC-Q101 Rev. D	HBM 8 KV, 1.5KΩ, 100pF, 3 pulses, alternately positive or negative	

■ Judgment Criteria

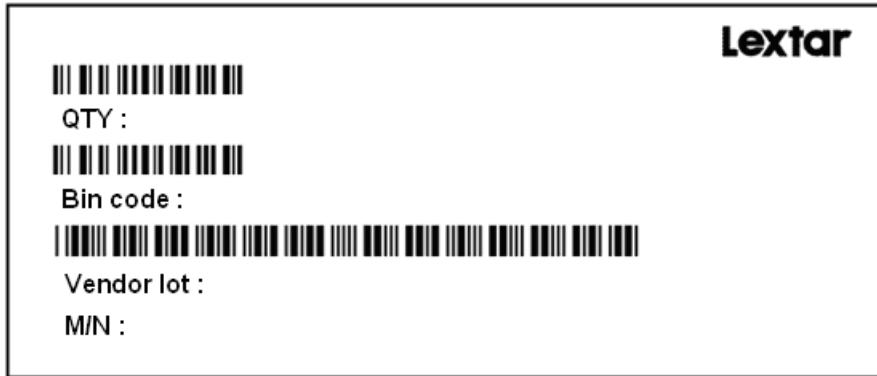
Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	20mA	$\Delta V_f < 10 \%$
Luminous Flux	Iv	20mA	$\Delta I_v < 20 \%$
Delta CIE	CIE-x ,CIE-y	20mA	$\Delta x,y < 0.01$

Packing

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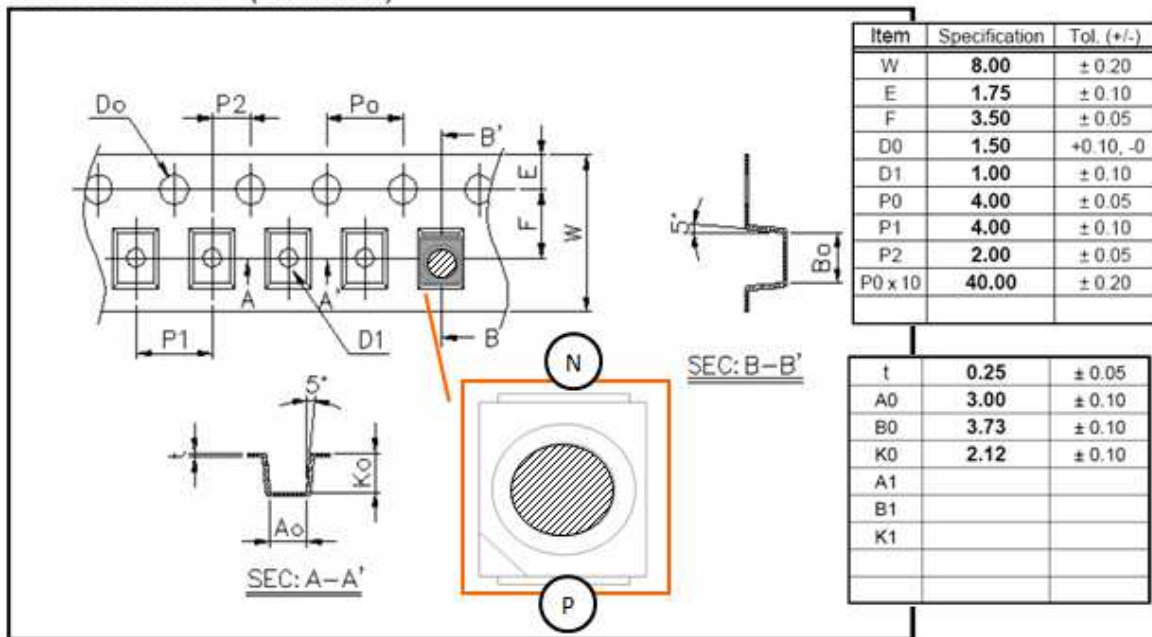
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Label

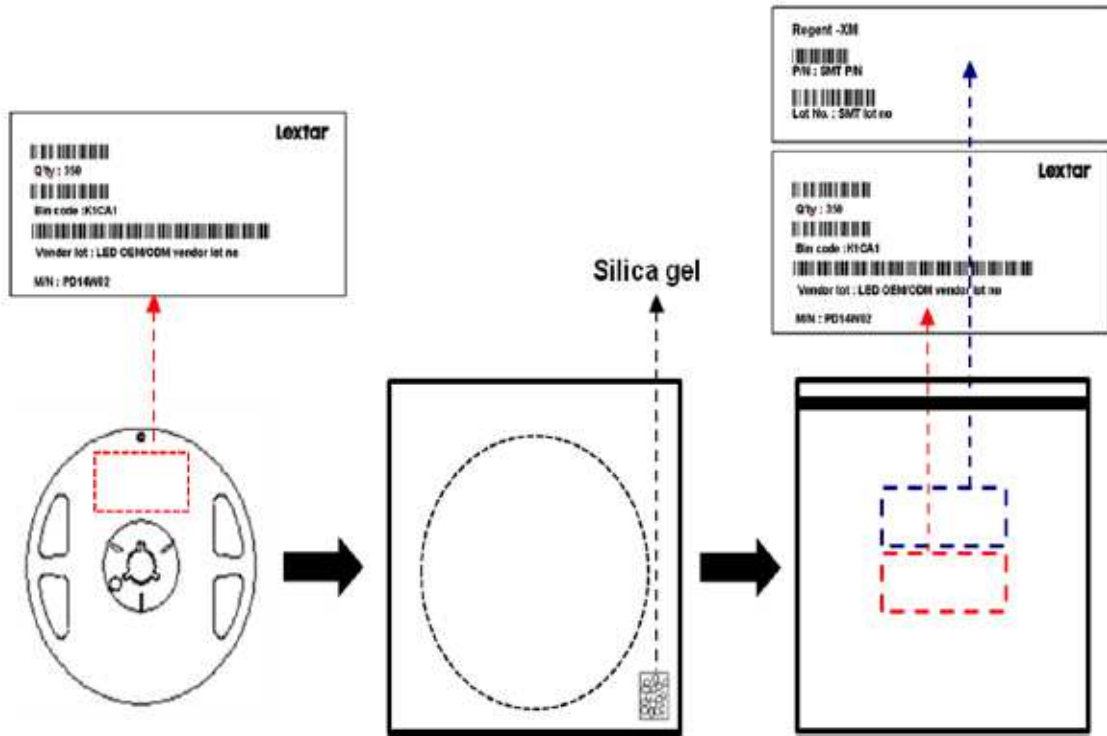


Carrier Taping

Dimensions. (Unit: mm)



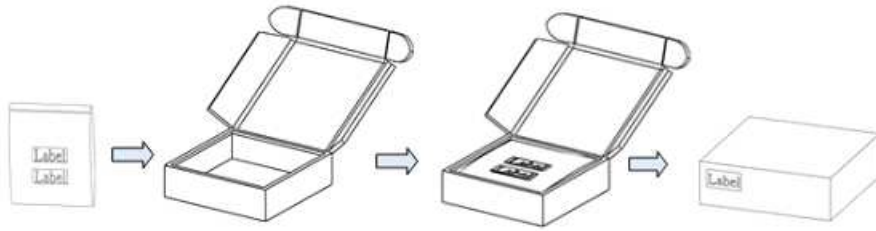
### Shield Bag Taping



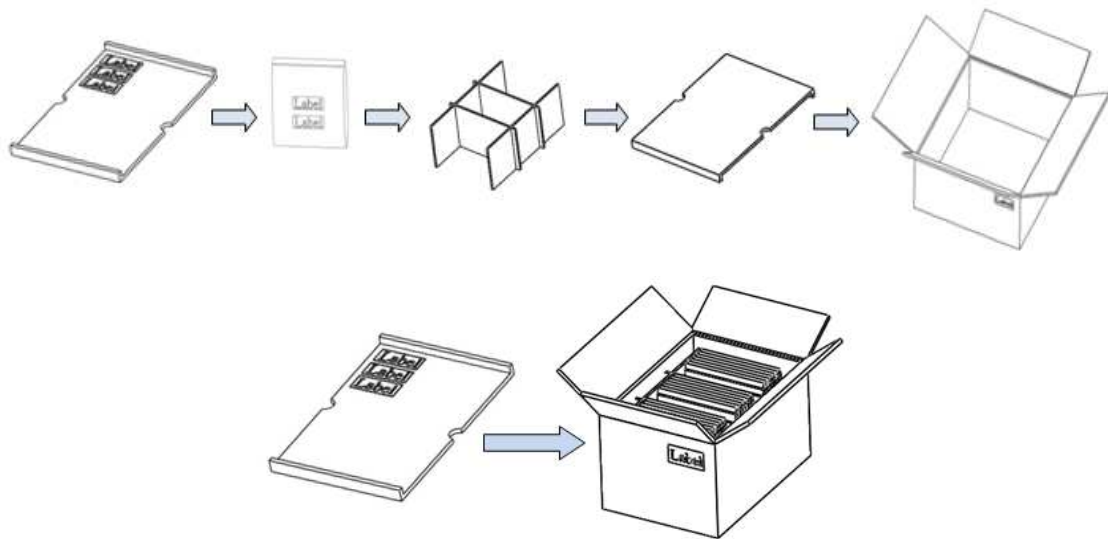
### Packing Box

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

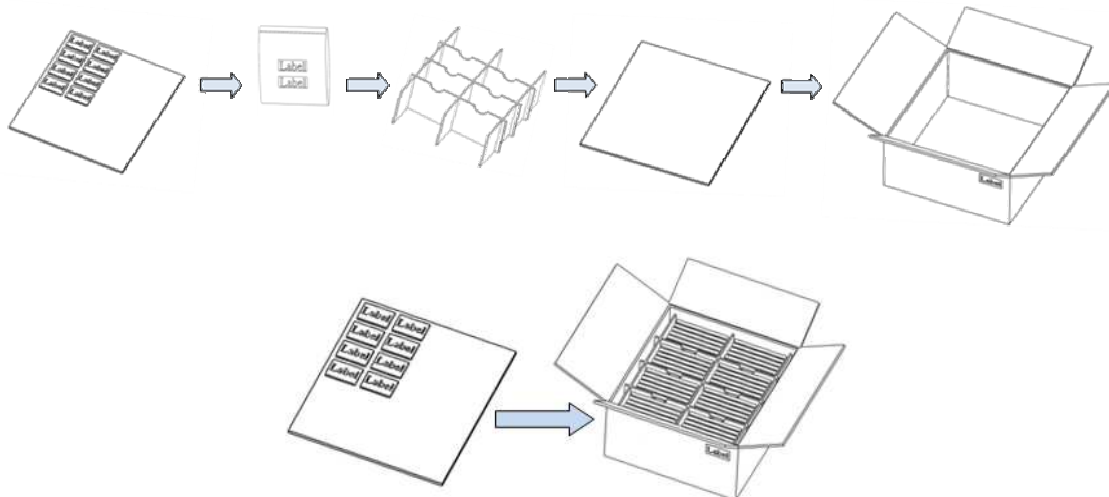
■ **Small Box**



■ **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.

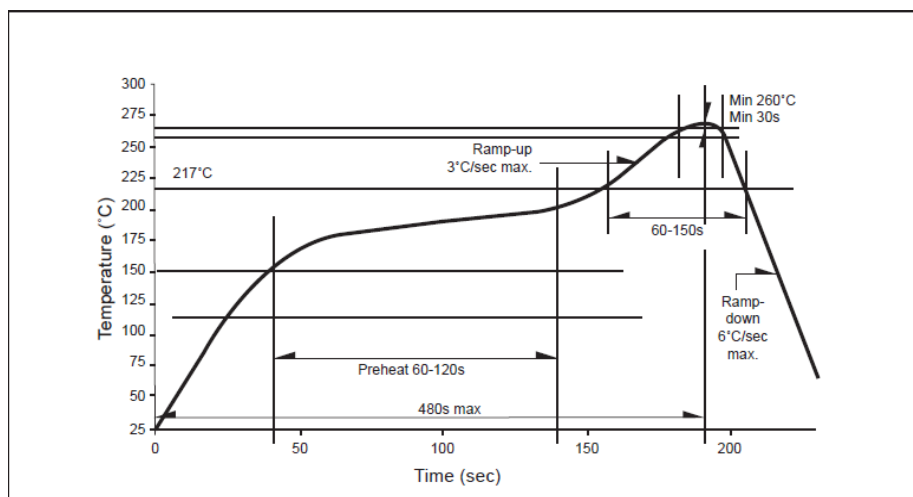
### ■ Storage

- 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
2017.07.04	NEW VERSION	Rudess	Bemore
2017.07.14	Update Features	Rudess	Bemore
2017.08.07	1. Update Reliability test – P.10 2. Soldering Notice and Conditions – P.14	Rudess	Bemore
2017.09.28	Update Binning – P.5~7	Rudess	Bemore
2018.03.11	Update Outline Dimension – P.4	Rudess	Bemore
2018.05.28	Update Carrier Taping – P.12	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.