



PF12N02 V0

Product Specification

Approval Sheet

PF12N02 V0

Product Specification

RoHS

Product	2070 White LED
Part Number	PF12N02 V0
Issue Date	2017/03/16



■ Feature

- ✓ White SMD LED (L x W x H) of 2.0 x 7.0 x 0.75 mm
- ✓ Dice Technology : InGaN
- ✓ Qualified according to JEDEC moisture sensitivity Level 1
- ✓ Environmental friendly ; RoHS compliance
- ✓ Packing : 100/500/1000 pcs/reel

■ Applications

- ✓ DRL
- ✓ Fog light
- ✓ Head lamp

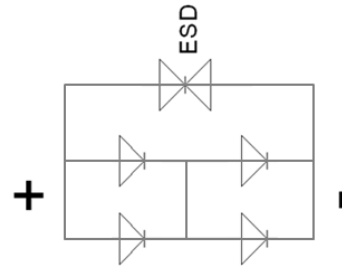
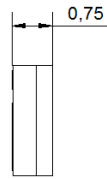
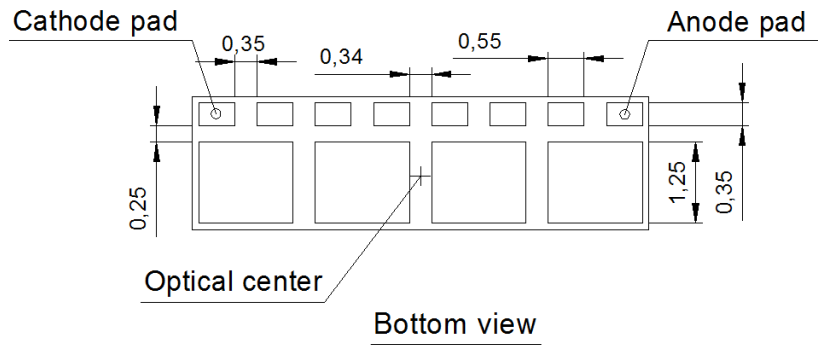
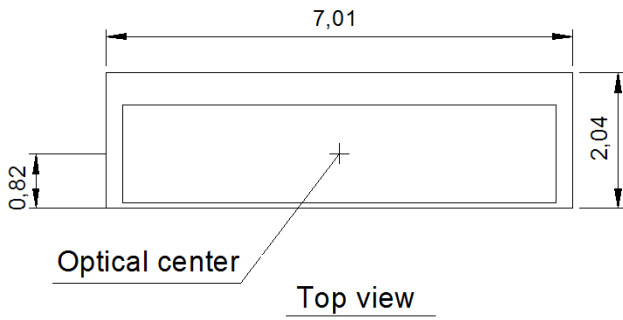
Outline Dimension

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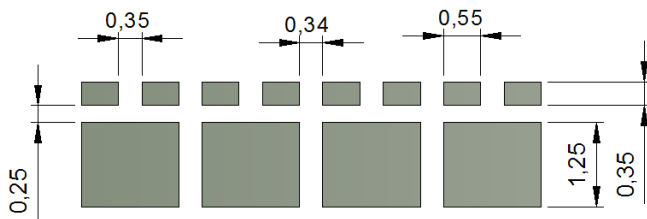
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■ PKG Size:

2.0 mm * 5.2 mm * 0.75mm (H)



■ Recommend Soldering Pad Layout



Unit: mm, Tolerance: $\pm 0.15\text{mm}$

Performance

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage ⁽¹⁾	V _F	I _F = 2400 mA	6	6.6	7.6	V
Luminous Flux	ΦV		1300	1650	1900	Lm
View Angle	θ		110	120	130	deg

- (1) The Forward Voltage tolerance is ±0.1V
- (2) The luminous flux tolerance is ±10%
- (3) Thermal resistance is calculated from junction to solder
- (4) Electric and optical data is tested at 50 ms pulse condition
- (5) The color coordinates measurement tolerance is ±0.01

■ Absolute Maximum Ratings

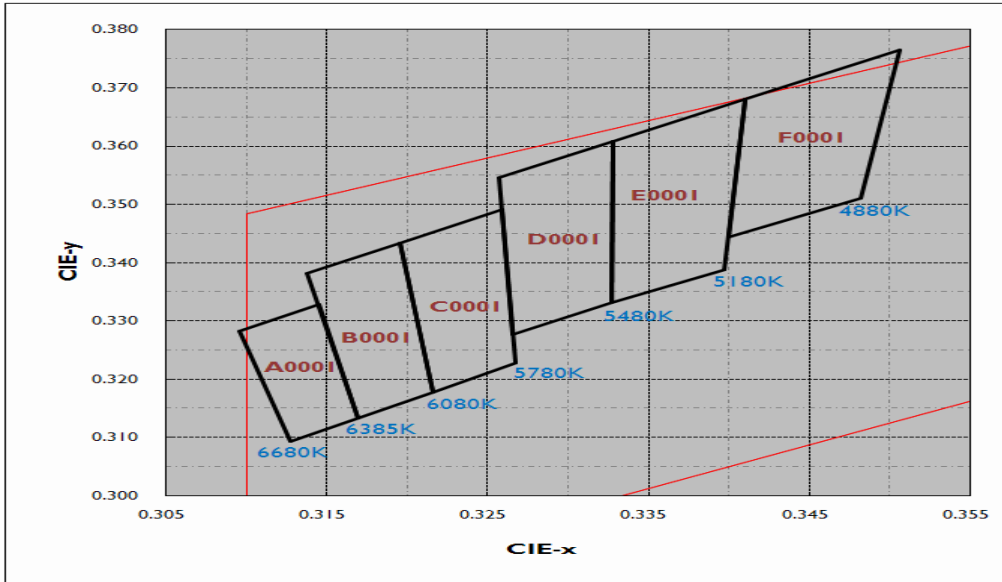
Parameter	Symbol	value	Unit
DC Forward Current ⁽¹⁾	I _F	3000	mA
Power Dissipation	P _D	23	W
Pulse Forward Current ⁽²⁾	I _{FP}	4000	mA
Storage Temperature	T _{stg}	-40 ~ +125	°C
Operating Temperature	T _{opr}	-40 ~ +125	°C
Junction Temperature	T _J	150	°C
Assembly Temperature	T _{sld}	260 (max. 5sec)	°C

- (1) Proper current rating must be observed to maintain junction temperature below maximum at all time
- (2) IFP shall be applied under condition as max duration time 400ms and 1/10 duty cycle.

Binning

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■ Chromaticity Coordinates



■ Bin code definition

V _F Rank	Luminous Flux Rank	CIE Rank
A	U4	A0001

V _F Rank	Condition	Min.	Max.
A	I _F = 2400 mA Ta = 25°C	6	6.4
B		6.4	6.8
C		6.8	7.2

Luminous Flux Rank	Condition	Min.	Max.
U4	I _F = 2400mA Ta = 25°C	1300	1400
U5		1400	1500
U6		1500	1600
U7		1600	1700
U8		1700	1800
U9		1800	1900

■ **CIE Rank**

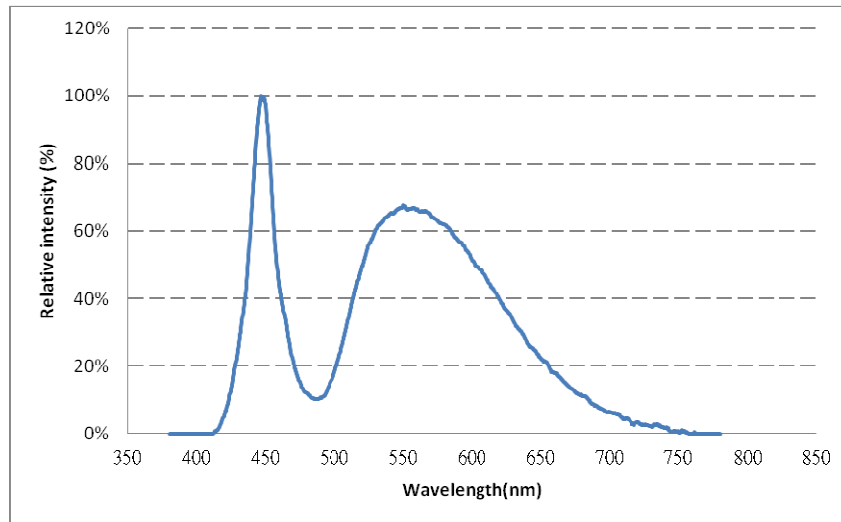
CCT	CIE Rank	CIE X	CIE Y
6385 ~ 6680	A0001	0.3096	0.3283
		0.3145	0.3328
		0.3169	0.3133
		0.3127	0.3093
6080 ~ 6385	B0001	0.3138	0.3381
		0.3195	0.3433
		0.3216	0.3178
		0.3169	0.3133
5780 ~ 6080	C0001	0.3195	0.3433
		0.3259	0.3491
		0.3267	0.3228
		0.3216	0.3178
5480 ~ 5780	D0001	0.3257	0.3546
		0.3328	0.3608
		0.3327	0.3331
		0.3265	0.3276
5180 ~ 5480	E0001	0.3328	0.3608
		0.3410	0.3681
		0.3397	0.3387
		0.3327	0.3331
4880 ~ 5180	F0001	0.3410	0.3681
		0.3506	0.3765
		0.3482	0.3510
		0.3400	0.3443

(1) Color bins are tested at IF = 2400mA 50ms pulse operation condition

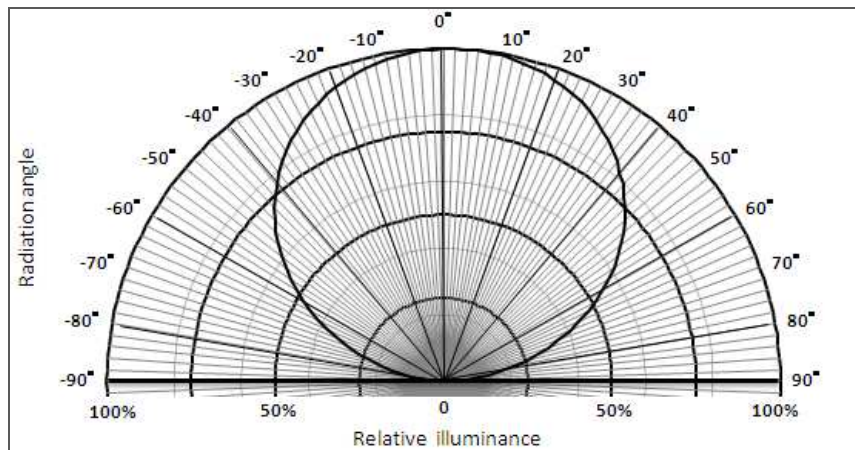
Characteristics

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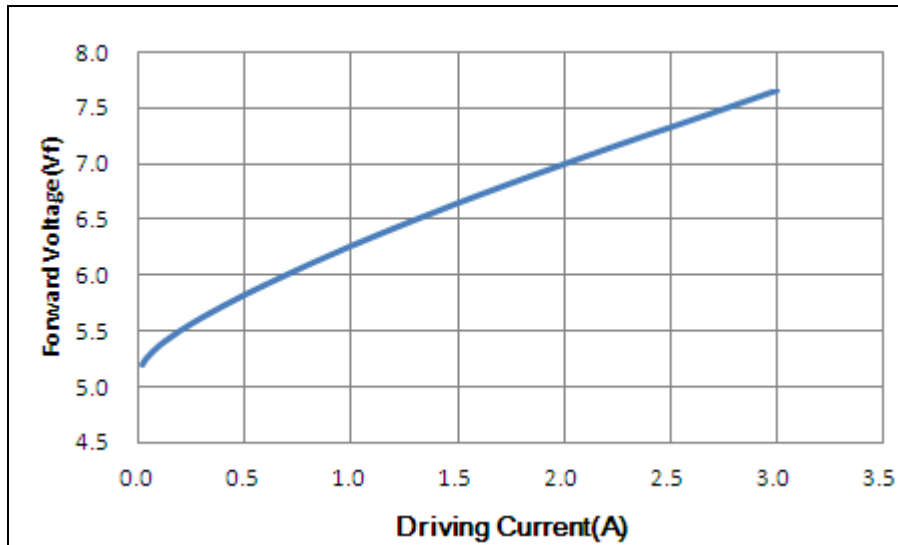
Spectrum



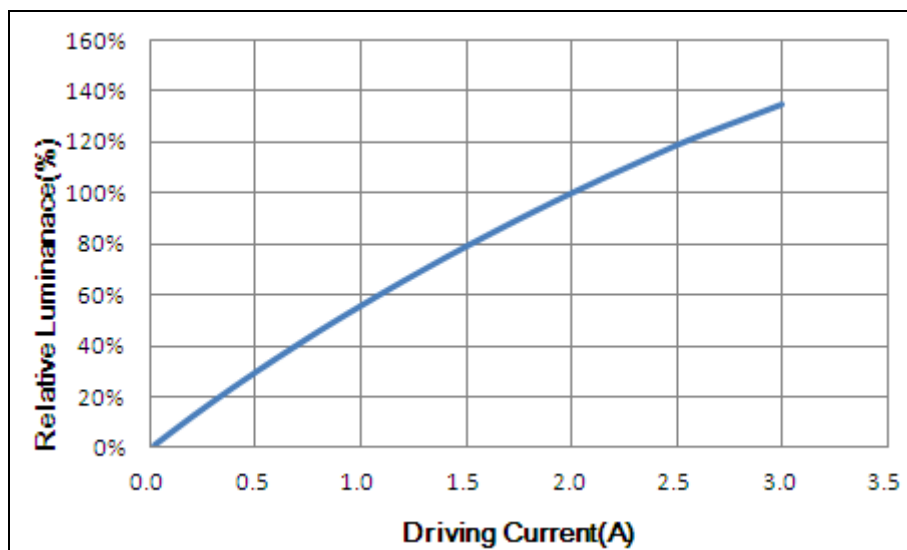
Radiation Pattern



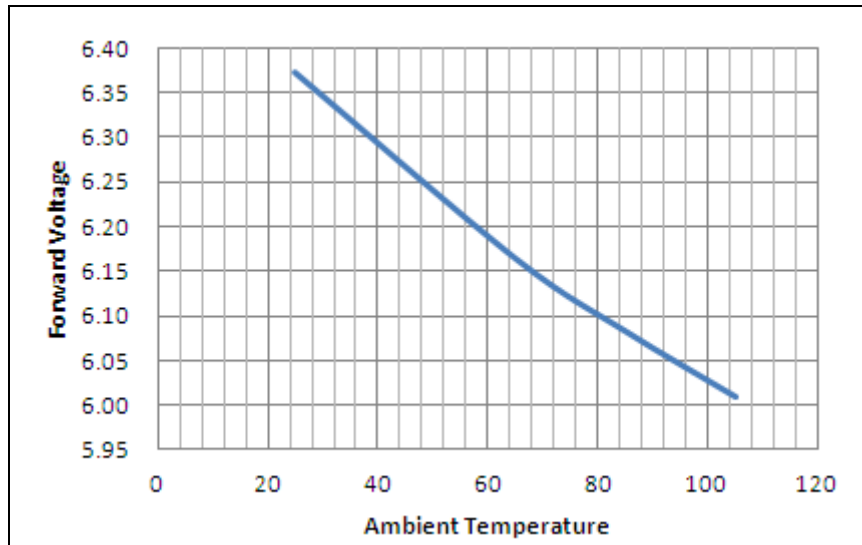
■ Forward Voltage vs. Forward Current



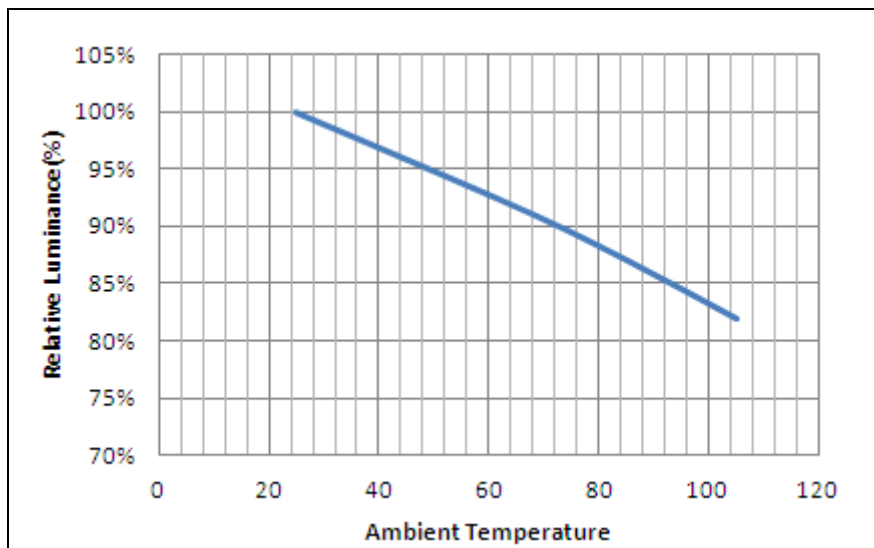
■ Forward Current vs. Relative Luminosity



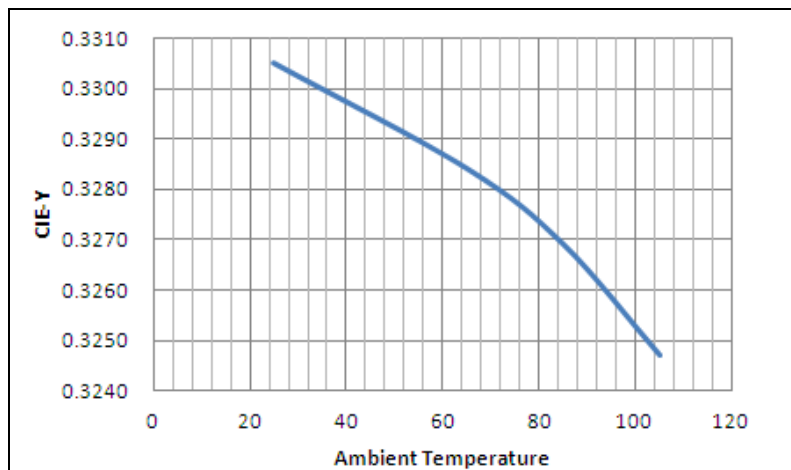
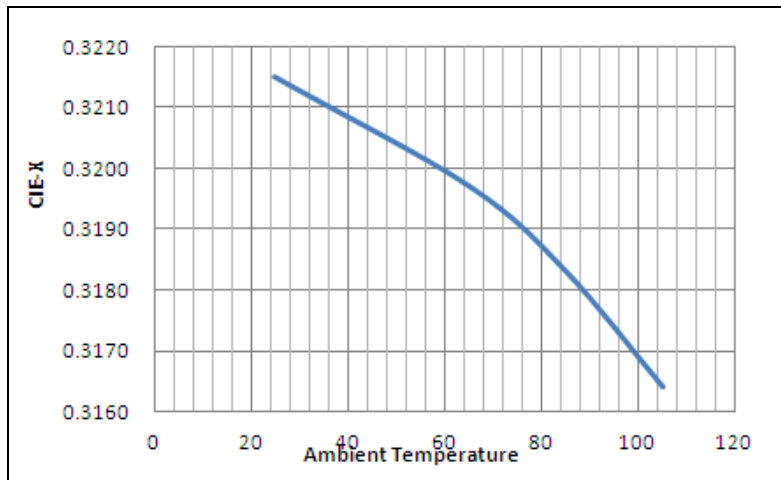
■ Relative Forward Voltage vs. Ambient Temperature



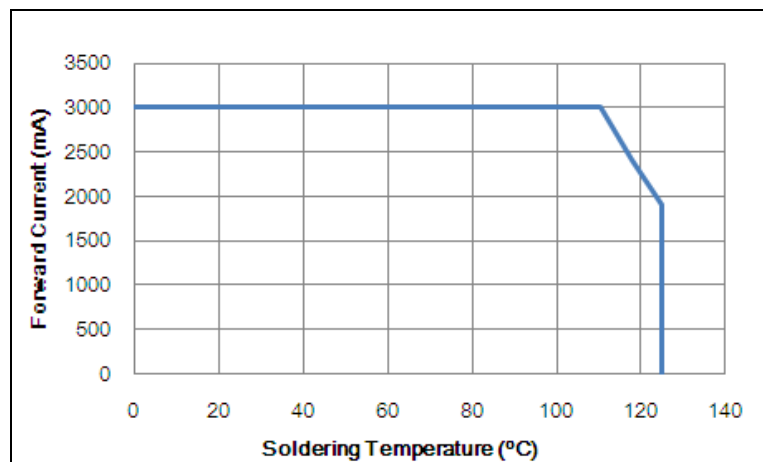
■ Relative Luminous Intensity vs. Ambient Temperature



■ Chromaticity vs. Ambient Temperature



■ Forward Current Derating Curve



Reliability

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Reliability test

Item	Condition	Current	Time/Cycle
Thermal Cycle	-40°C/20min ~ 125°C/20min	NA	1000 cycles
Power and Temperature Cycle	-40°C-85°C/10min transfer 20 min power cycle 7500cys	1.5 A	500 cycles
High Humidity Heat Operating	1000 hours at TA=85°C/85% RH with part Forward biased	1.5 A	1000 Hrs
High Temperature Operating	85°C 1000 hours at the maximum forward bias	1.5 A	1000 Hrs
Low Temperature Operating	-40°C	1.5 A	1000 Hrs
ESD Test	8KV	NA	3times
Thermal Shock	-40°C ~ 100°C	NA	1000 Cycles
Sulfur test	H2S 15ppm ; 40°C/90%	NA	336hrs

Judgment Criteria

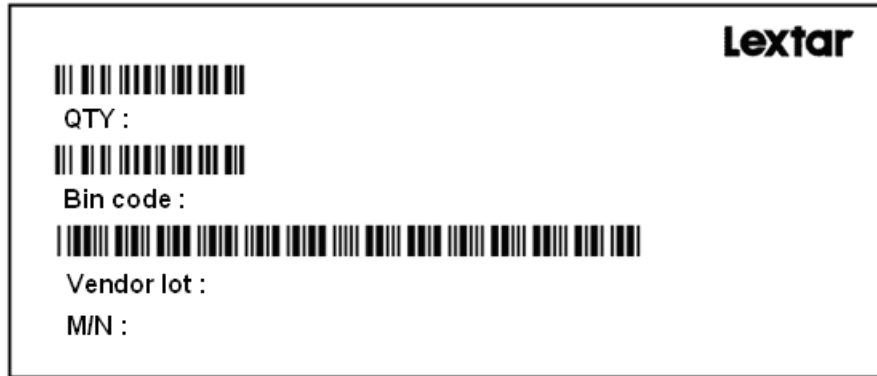
Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	1.2 A	$\Delta Vf < 10 \%$
Luminous Flux	Iv	1.2 A	$\Delta Iv < 20 \%$

Packing

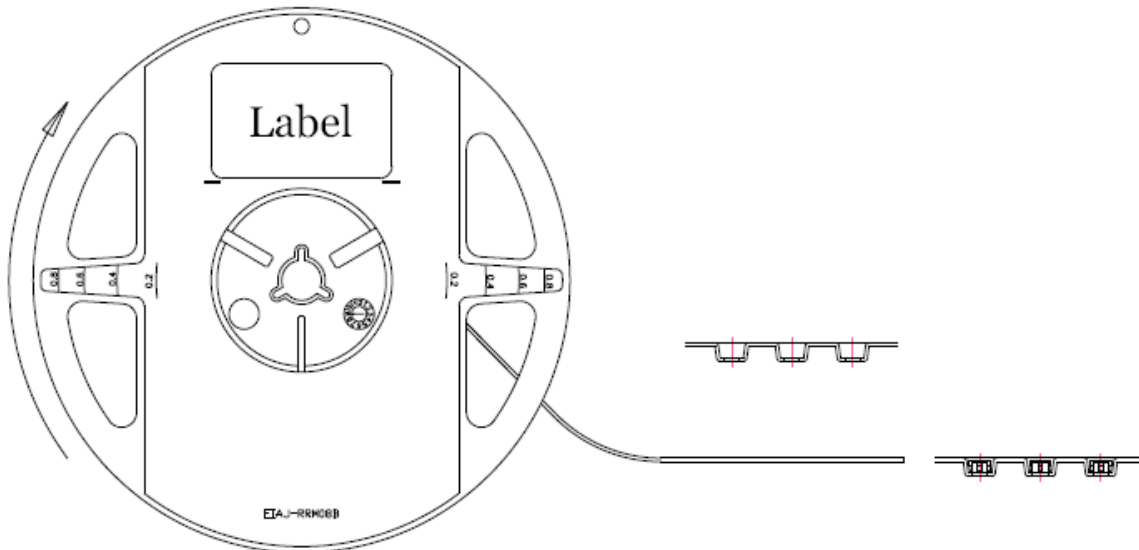
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Label



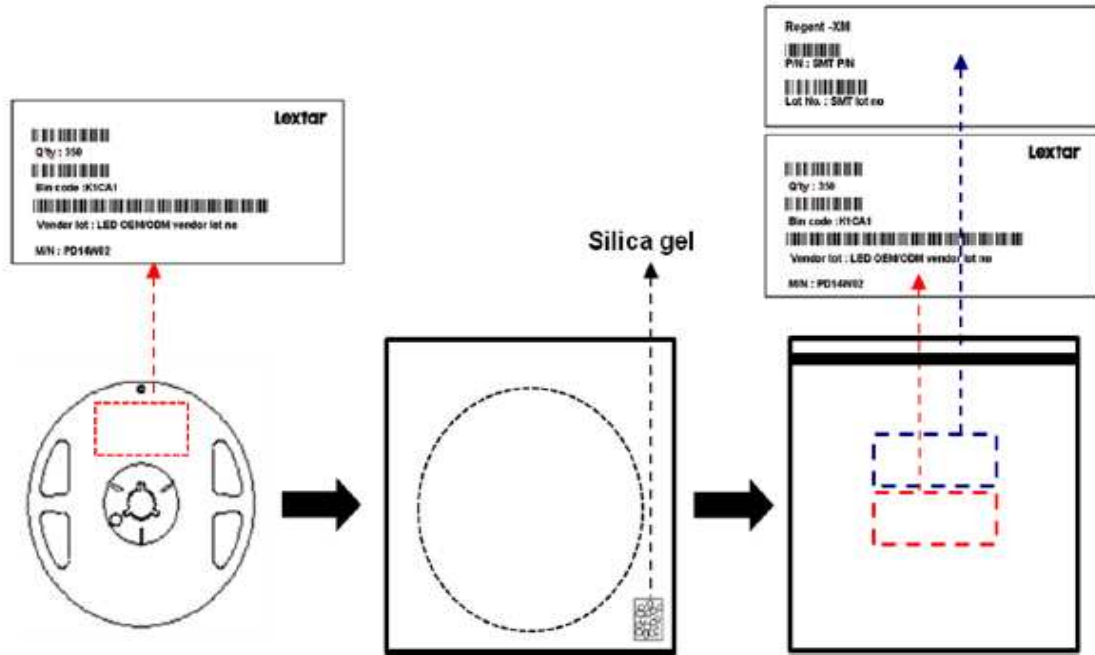
Carrier Taping



Notice:

1. 10 Sprocket hole pitch cumulative tolerance is $\pm 0.20\text{mm}$.
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.

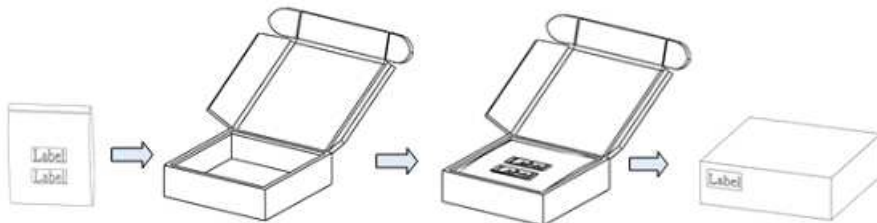
■ **Shield Bag Taping**



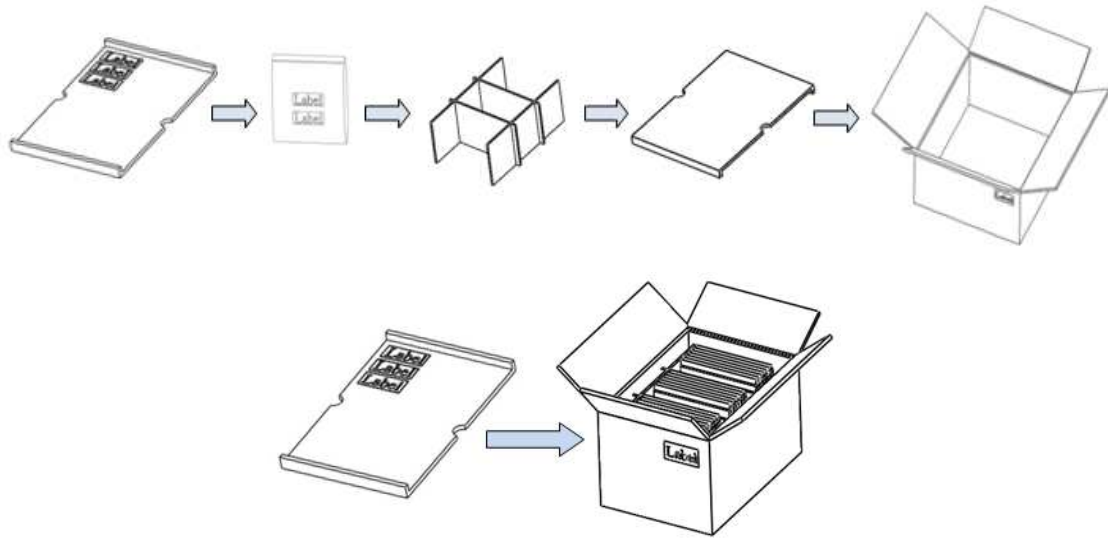
■ **Packing Box**

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

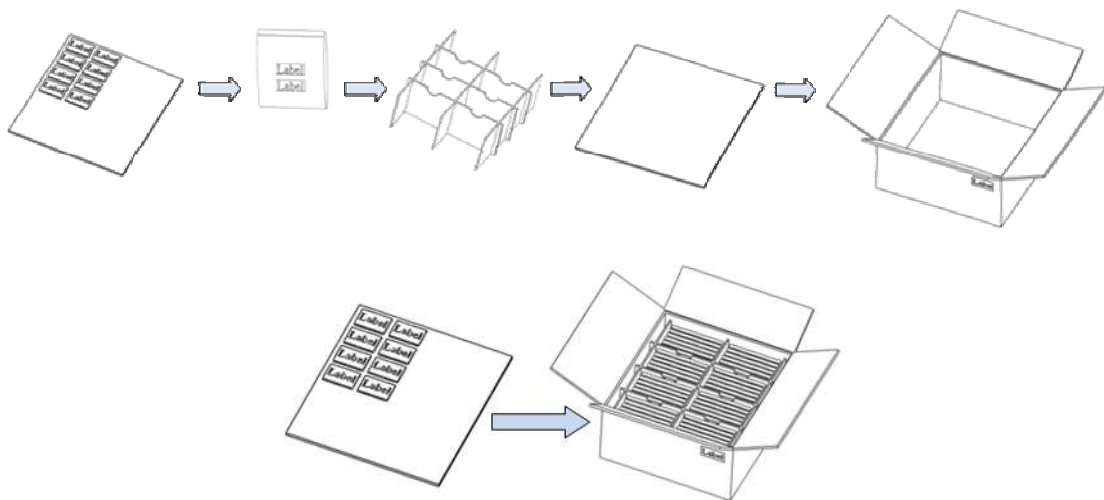
■ **Small Box**



■ **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 storage under 30°C, 60% RH.
- After opening the package bag, the LEDs should be keep under 30°C, 60% RH. Recommend to use within 168 hrs. If unused LEDs remain, suggest to store into moisture proof bag or original package bag with moisture absorbent material such as silica gel. Reseal well is necessary.
- If the product exceeded the storage period or the moisture absorbent material faded away, baking treatment should be done by following conditions.
Bake condition: 60°C, 12hours (One time only).

■ Soldering Notice and Conditions

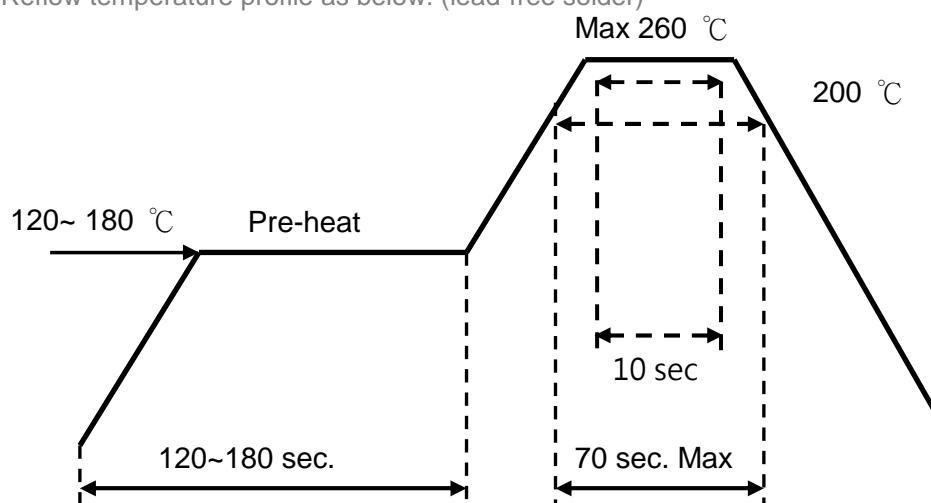
- When soldering LEDs, do not solder/reflow the same LED over two times.
- Recommend soldering conditions:

Hand soldering: 350 °C max, 3 sec. max.

Reflow soldering: Pre-heat 150 °C max, 180 sec. max.

Peak 260 °C max, 10 sec. max.

- Reflow temperature profile as below: (lead-free solder)



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

Revision History

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Date	Contents	Writer	Approved
2017.03.16	Preliminary version	Sean Tsai	SK Chen

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.