No. 3, Gongye E. 3rd Road, Hsinchu Science Park, Hsinchu 30075, Taiwan
TEL：886-3-565-8800

Lextar

PC33R46 V0 Preliminary

Product Specification

No. 3, Gongye E. 3rd Road, Hsinchu Science Park, Hsinchu 30075, Taiwan
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Approval Sheet

PC33R46
Product Specification

Product	Red SMD LED
Part Number	PC33R46 V0
Issue Date	2018/12/31

Features

- ✓ Red SMD LED (L x W x H) of 3.2 x 3.0 x 0.6 mm
- ✓ AEC-Q102 qualification
- ✓ Dice Technology : InGaAlP
- ✓ Qualified according to JEDEC moisture sensitivity Level 2
- ✓ Cu Alloy with Gold plated lead frame
- ✓ Environmental friendly ; RoHS compliance
- ✓ Packing : 2,000 / 1,000 pcs/reel

Applications

- ✓ Automotive lighting
- ✓ Stop light
- ✓ Center high mounted stop light

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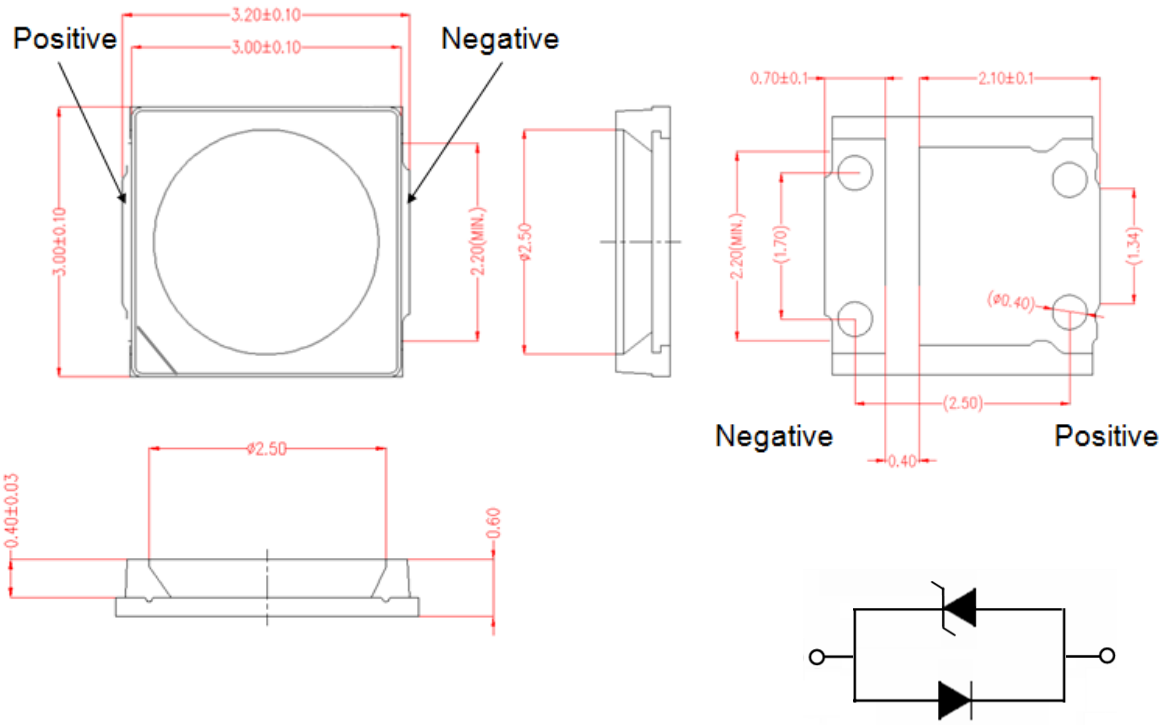
Outline Dimension

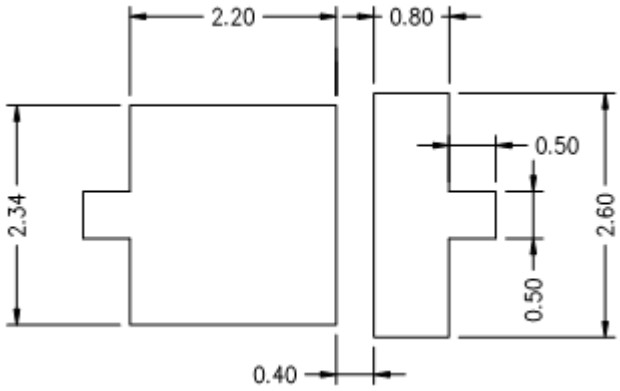
PC33R46
Product Specification

Package Dimension



Unit: mm, Tolerance: ±0.1mm

Recommended Soldering Pad



Unit: mm, Tolerance: ±0.1mm

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Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F = 350 mA	1.9	2.25	2.65	V
Dominant Wavelength	Wd		612	617	625	nm
Luminous Flux	Iv		40	55	70	lm
View Angle	θ			120		deg
Thermal Resistance	Rthj-s			16		℃/W

* The Forward Voltage tolerance is ±0.05V

* The luminous intensity tolerance is ± 8%

Absolute Maximum Ratings

Parameter	Symbol	value	Unit
DC Forward Current	I_F	500	mA
Power Dissipation	P_D	1.33	W
Pulse Forward Current(1)	I_{FP}	1000	mA
Storage Temperature	T_{stg}	-40 ~ +125	°C
Operating Temperature	T_{opr}	-40 ~ +125	°C
Junction Temperature	T_J	150	°C
ESD (HBM)	ESD_{HBM}	8000	V
Assembly Temperature	Tsld	260	°C

(1) I_{FP} Condition: t < 10 μs；D = 0.005；T_S= 25 °C

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Bin code definition

V_F Rank	Luminous Intensity Rank	Dominant Wavelength Rank
A	R1	A1000

Forward Voltage Group

V_F Rank	Condition	Min. (V)	Max. (V)
A	I_F = 350 mA Ta=25℃	1.90	2.05
B		2.05	2.20
C		2.20	2.35
D		2.35	2.50
E		2.50	2.65

Luminous Intensity Group

Luminous Intensity Rank	Condition	Min. Iv (lm)	Max. Iv (lm)
R1	I_F = 350 mA Ta=25℃	40	46
R2		46	53
R3		53	61
R4		61	70

Dominant Wavelength Group

Group	Condition	Min. λ (nm)	Max. λ (nm)
A1000	I_F = 350 mA Ta=25℃	612	616
A2000		616	620
A3000		620	625

* The Forward Voltage tolerance is ±0.05V

* The luminous intensity tolerance is ± 8%

* The Wavelength tolerance is ±1nm

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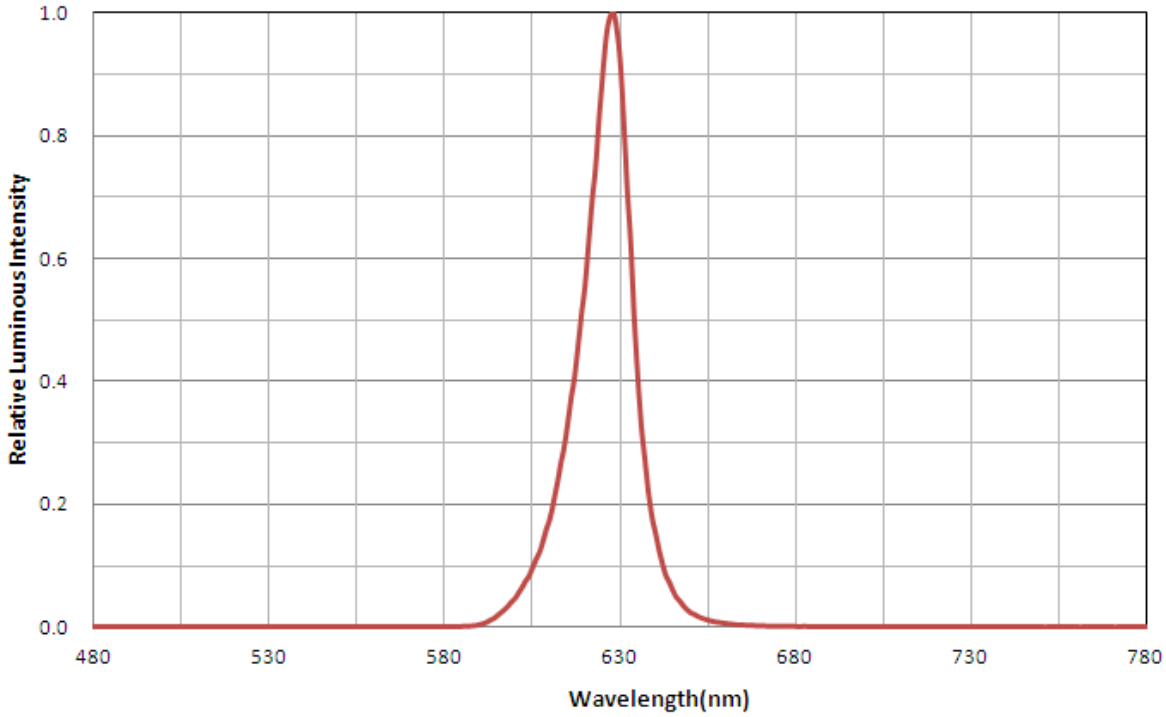
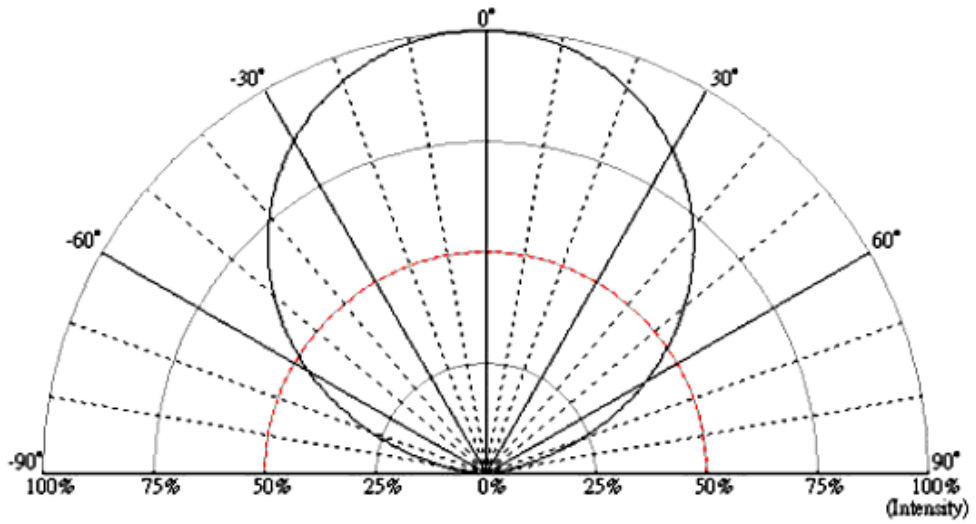
Color Spectrum, I_F=350mA, Ta=25℃



Viewing Angle Distribution, IF=350mA, Ta=25℃



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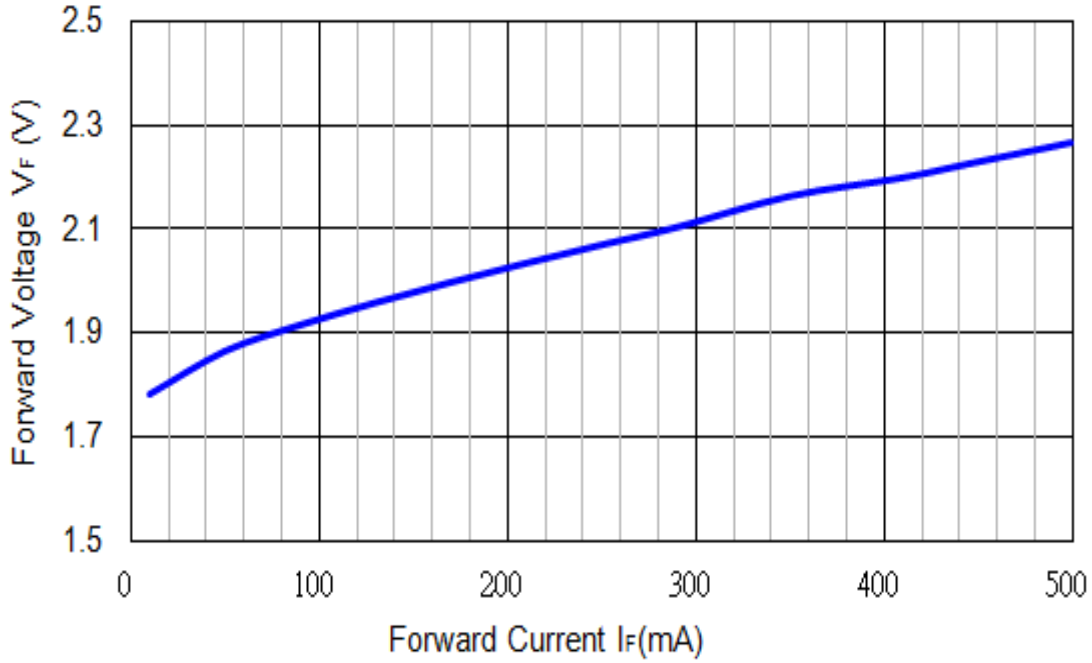
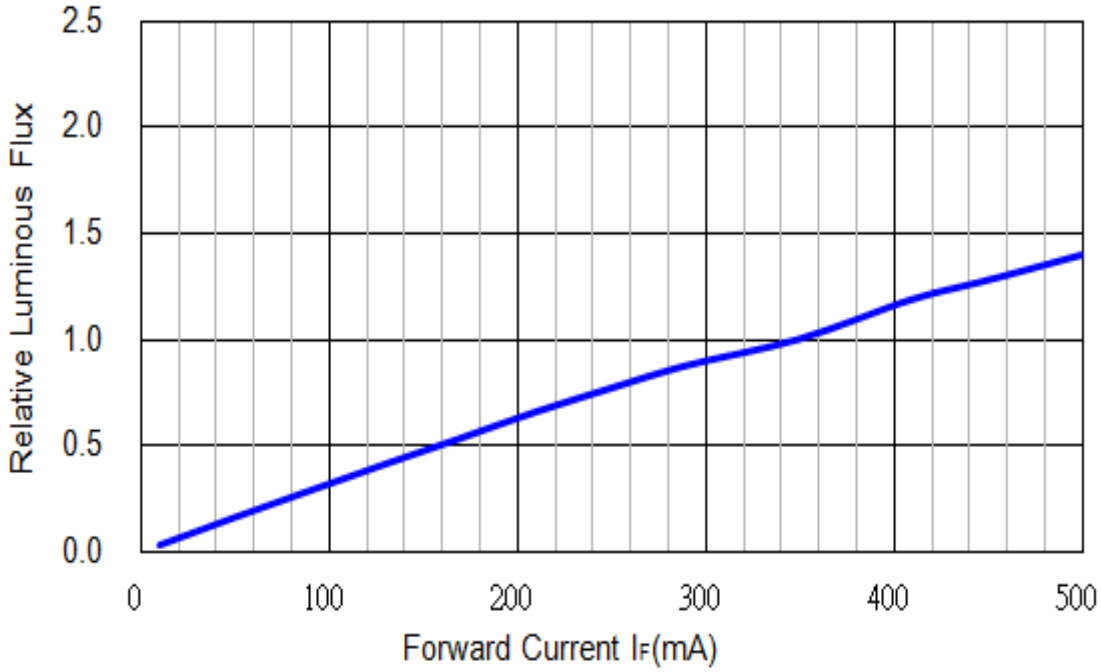
Forward Voltage vs. Forward Current, Ta=25℃



Forward Current vs. Relative Luminosity Intensity, Ta=25℃



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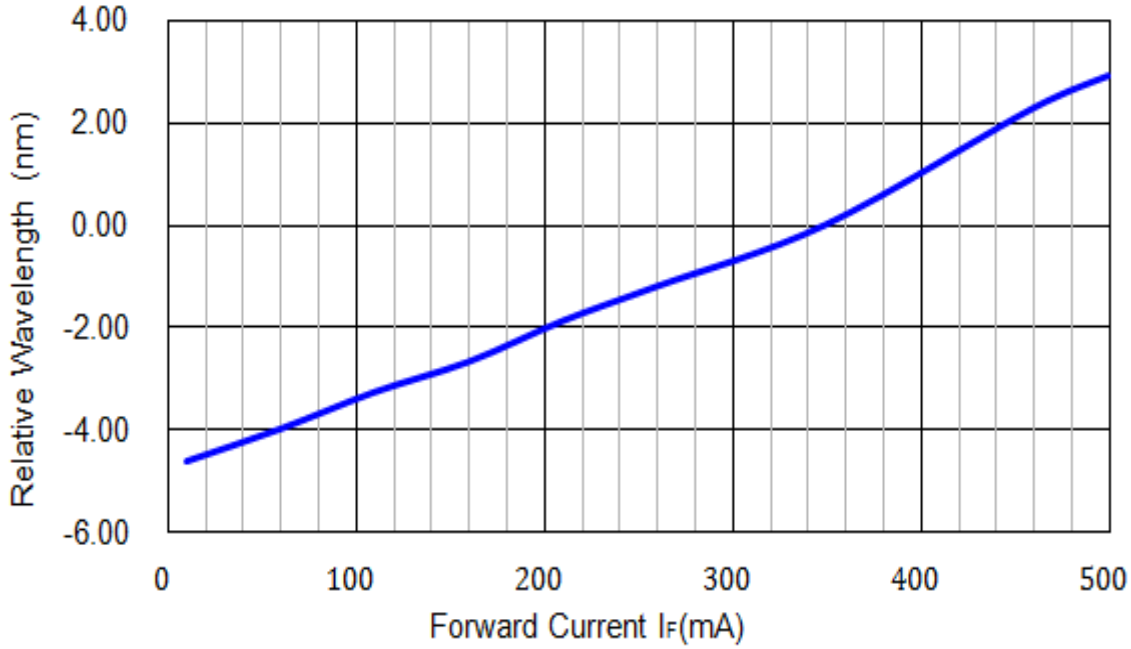
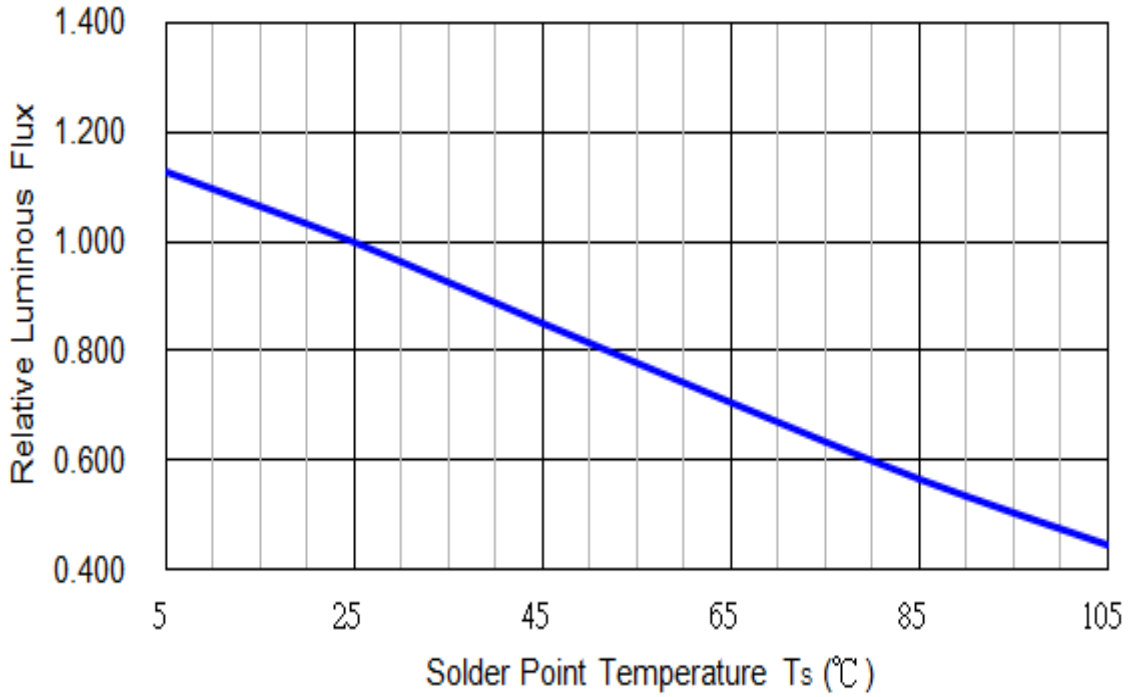
Forward Current vs. Dominant Wavelength



Soldering Temperature vs. Relative Luminance, I_F=350mA



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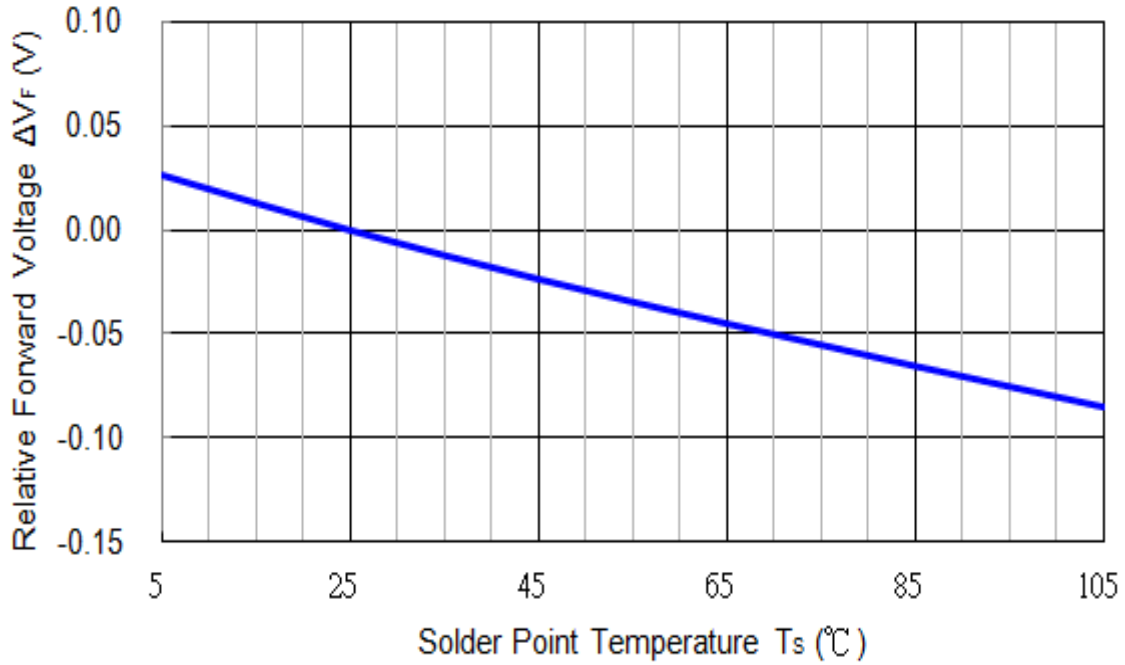
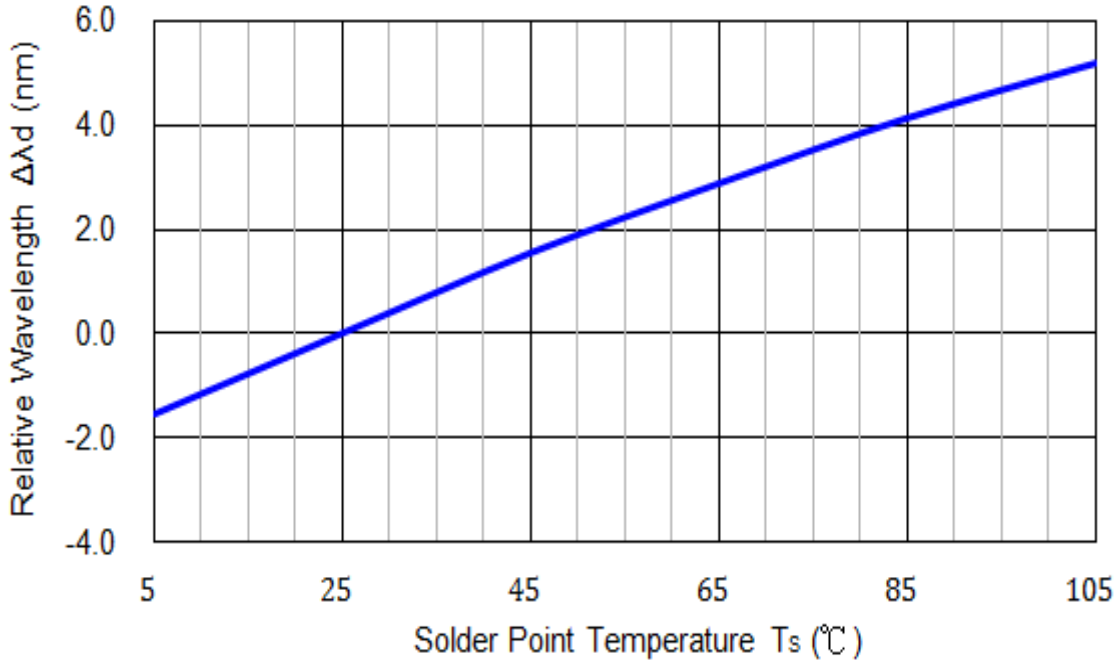
Soldering Temperature vs. Forward Voltage Shift, I_F=350mA



Soldering Temperature vs. Dominant Wavelength, I_F=350mA



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Reliability test

	Item	Reference Standard	Condition	Time/Cycle
1	Thermal shock	JESD22-A106	-40℃ to 125 ℃, 20 mins dwell, 5 min transfer time	1000 Cycles
2	Temperature Cycle	AEC-Q101 Rev. D	-55℃ to 125 ℃ 15 mins dwell at each high and low temperature extreme	1000 cycles
3	Power and Temperature Cycle	AEC-Q101 Rev. D	-40 ℃~ 125 ℃, IF= Tj max., 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℃ / 60% RH	168 hours
5	High Temperature Storage	JESD22-A103	TA=125℃, 1000h	1000 hours
6	Low Temperature Storage	JESD22-A119	TA=-40℃, 1000h	1000 hours
7	High Temperature Operating Life	AEC-Q101 Rev. D	TA=125℃, IF= Tj max.	1000 hours
8	Low Temperature Operating Life	JESD22-A108	TA=-40℃, IF=500mA	1000 hours
9	Temperature Humidity Operating Life	AEC-Q101 Rev. D	85℃, RH=85%, 1000h, IF=500mA	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_2S]	336 hours
	EN60068-2-60	[25 °C / 75 %RH / 200 ppb SO_2, 200 ppb NO_2,10 ppb Cl_2]	504 hours

Judgment Criteria

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	350mA	ΔVf < 10 %
Luminous Flux	Iv	350mA	ΔIv < 20 %
Delta CIE	CIE-x ,CIE-y	350mA	△x,y <0.01

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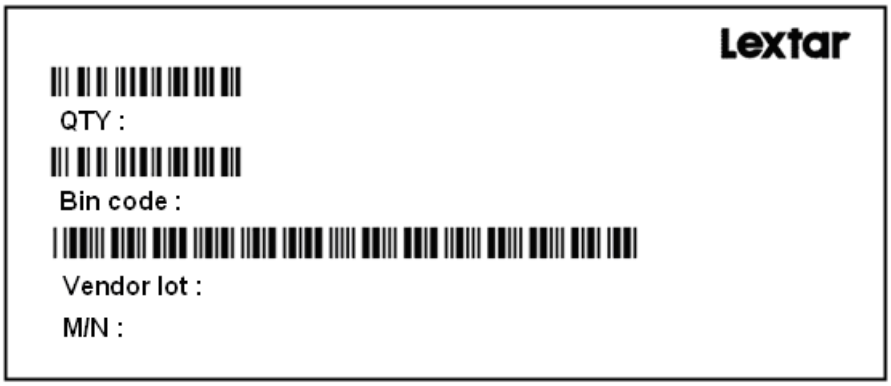
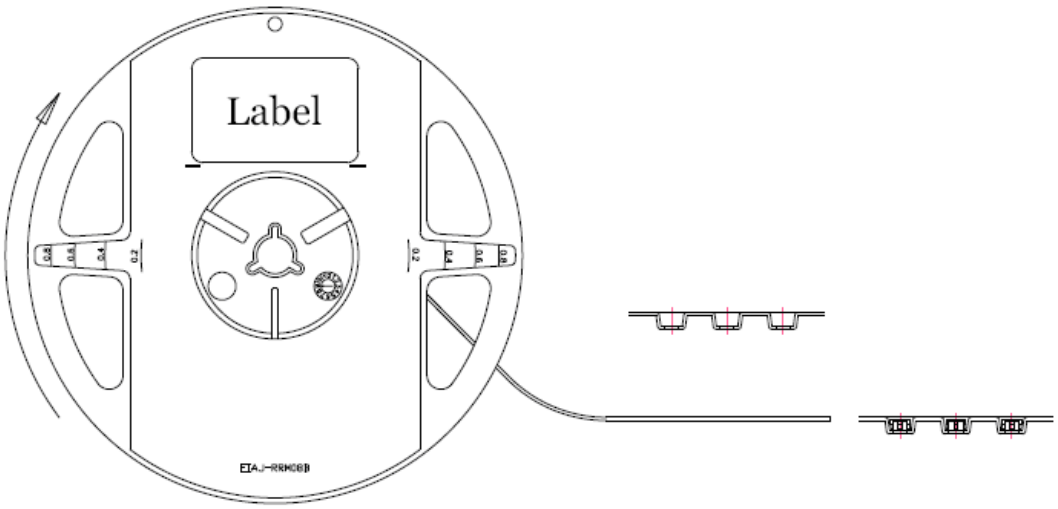
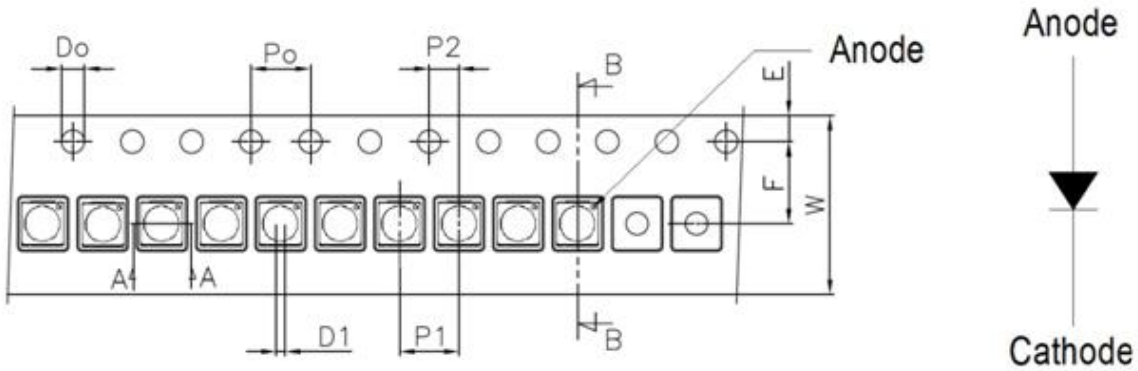
Label



Carrier Taping





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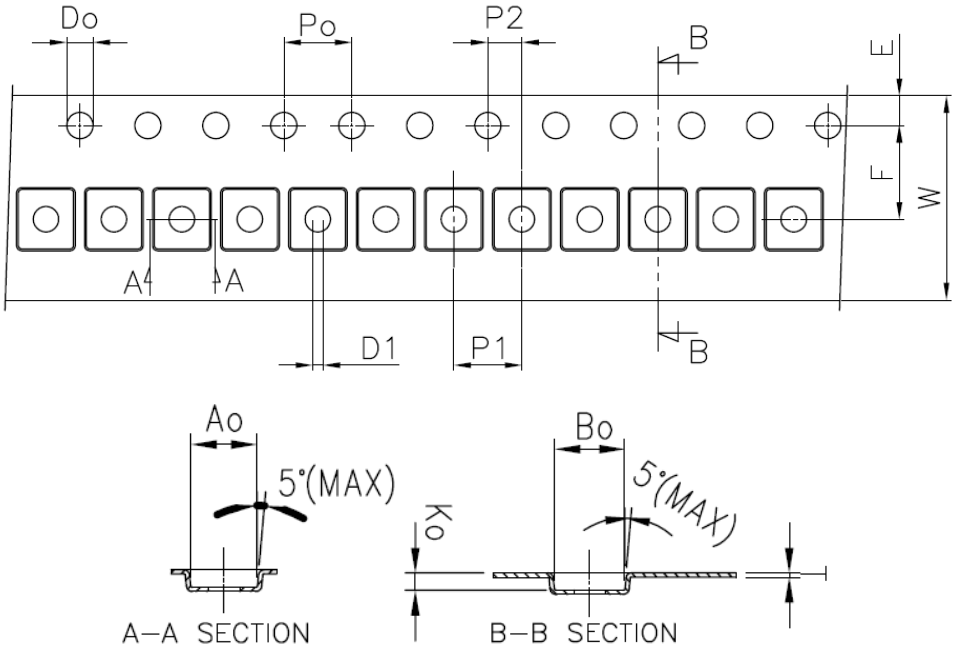

Unit:mm

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	$1.50^{+0.10}_{-0}$	1.50±0.10	12.0±0.30	40.00±0.20	

Notice:

1. 10 Sprocket hole pitch cumulative tolerance is ±0.20mm.
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 resisivity 10^4 ~10^8 ohm/sq.

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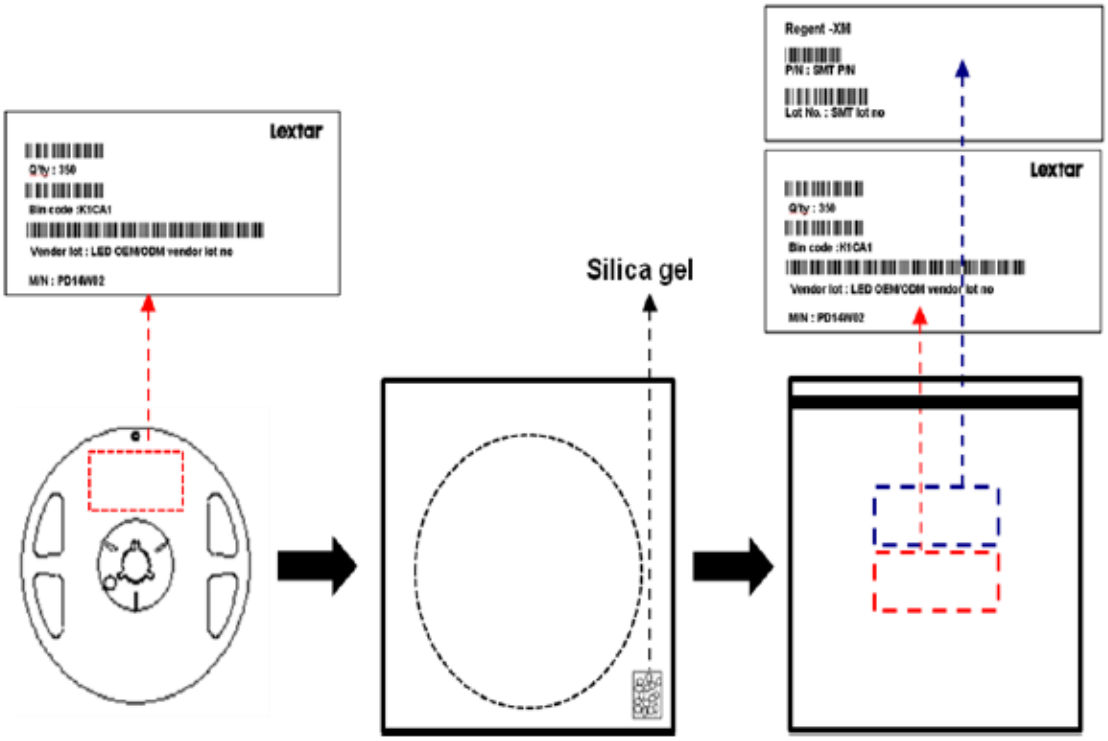
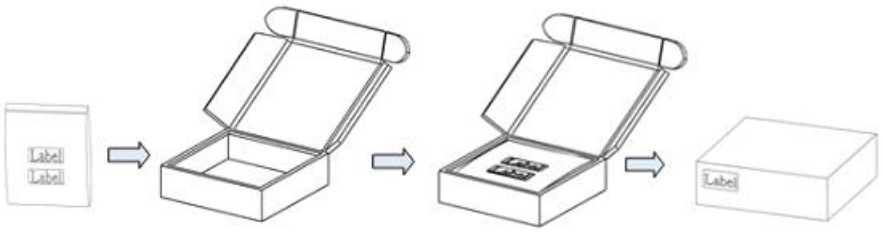
Shield Bag Taping



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



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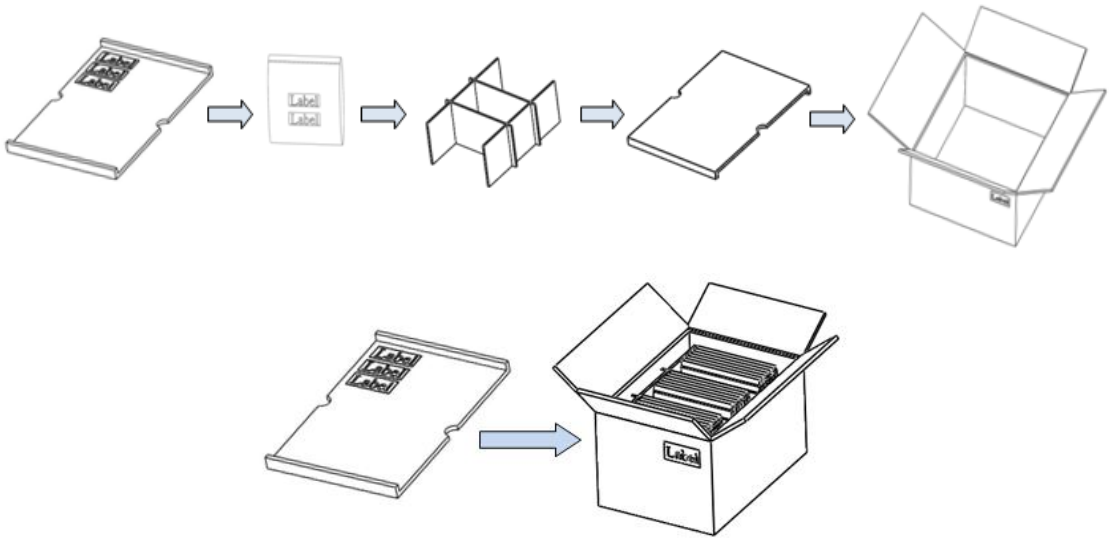
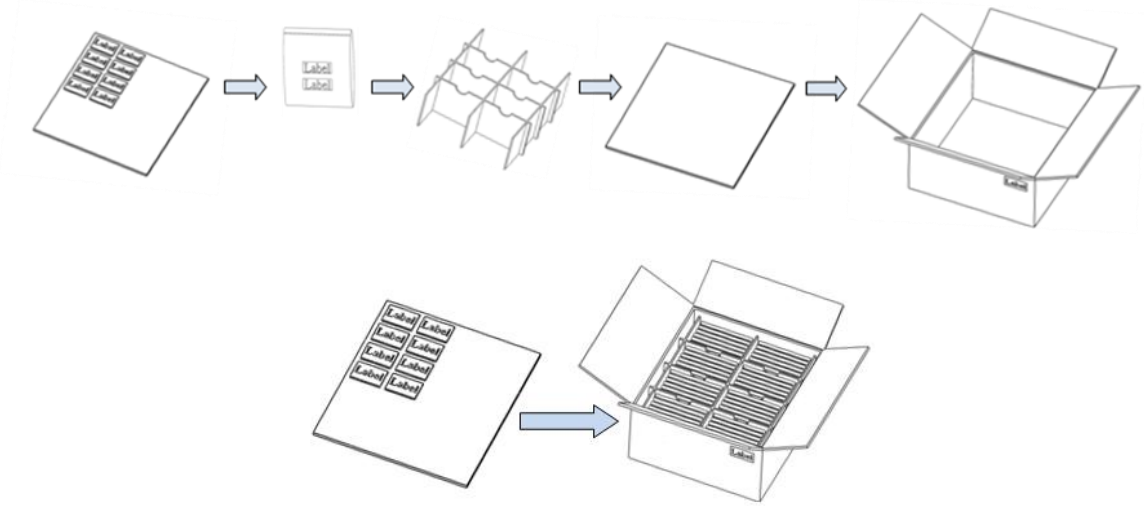
Medium Box



Large Box



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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.

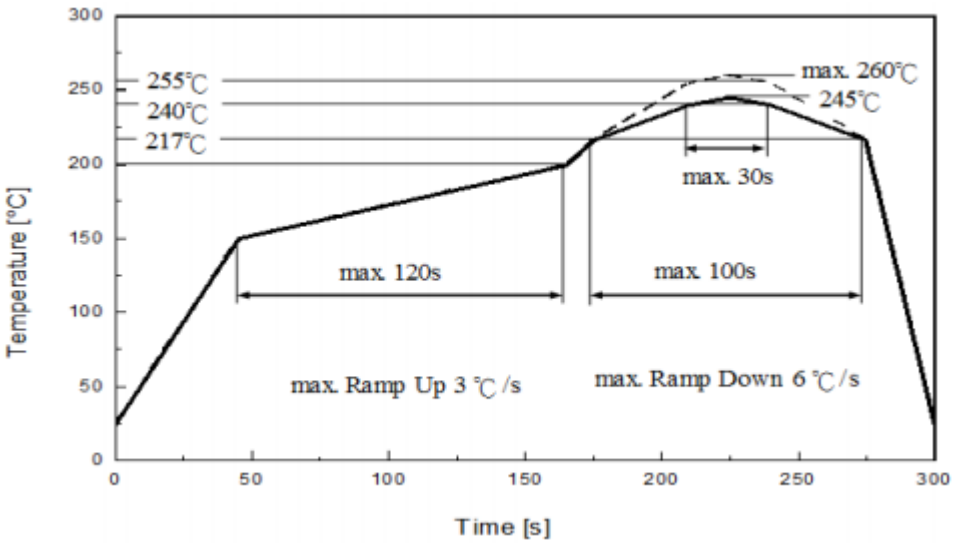
Storage

- 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 ± 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.

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Revision History

Date	Contents	Writer	Approved
2018.10.11	Preliminary version	Rick	Bemore
2018.12.05	Update Characteristics – P.8~10	Rick	Bemore
2018.12.31	Update Soldering Notice and Conditions – P.16	Rick	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.