



**PC35R14 V0 Preliminary**  
**Product Specification**

## Approval Sheet

PC35R14

Product Specification



<b>Product</b>	Red SMD LED
<b>Part Number</b>	PC35R14 V0
<b>Issue Date</b>	2017/09/11



### ■ Features

- ✓ Red 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 : AlGaInP
- ✓ Qualified according to JEDEC moisture sensitivity Level 2
- ✓ Cu Alloy with Gold plated lead frame
- ✓ Environmental friendly ; RoHS compliance
- ✓ ESD protection
- ✓ Packing : 2,000 / 1,000 / 500 pcs/reel

### ■ Applications

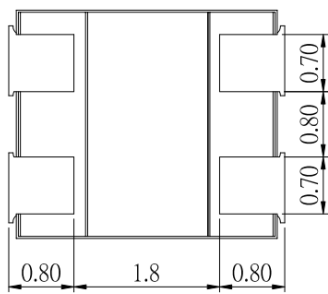
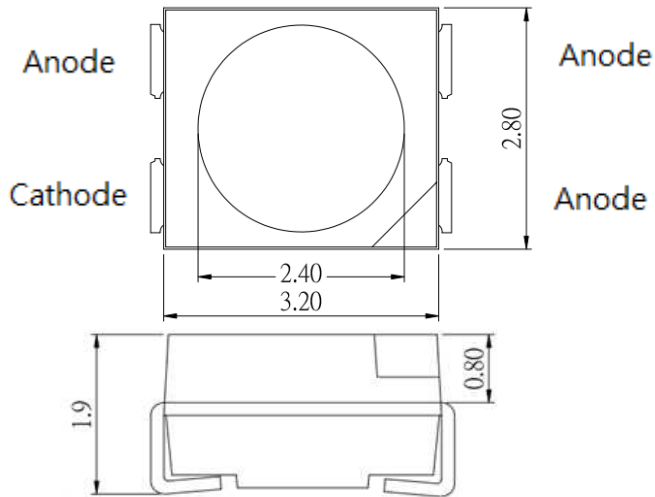
- ✓ Center high mounted stop light
- ✓ Back-up light

## Outline Dimension

PC35R14

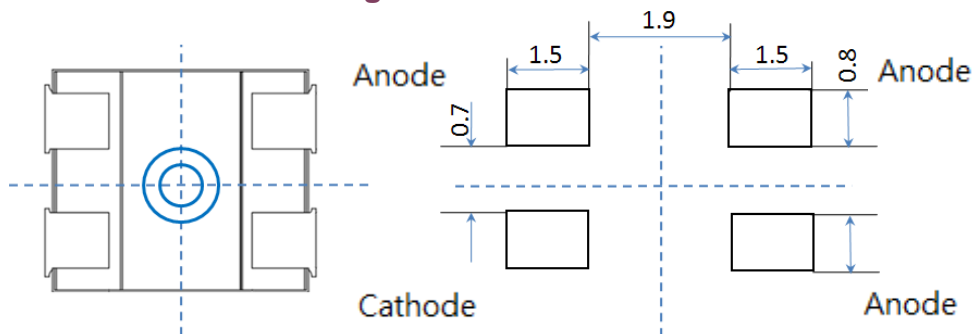
Product Specification

### Package Dimension



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

### Recommended Soldering Pad



Performance

PC35R14

Product Specification

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	$V_F$	$I_F = 50 \text{ mA}$	1.9	2.25	2.65	V
Dominant Wavelength	$Wd$		612	618	624	nm
Luminous Intensity	$I_v$		1400	3000	3550	mcd
View Angle	$\theta$		-	120	-	deg
Thermal Resistance	$R_{th}$		45			$^{\circ}\text{C/W}$

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

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

\* The Wavelength tolerance is  $\pm 0.5\text{nm}$

■ **Absolute Maximum Ratings**

Parameter	Symbol	value	Unit
DC Forward Current <sup>(1)</sup>	$I_F$	70	mA
Power Dissipation	$P_D$	0.12	W
Pulse Forward Current <sup>(2)</sup>	$I_{FP}$	100	mA
Storage Temperature	$T_{stg}$	-40 ~ +105	$^{\circ}\text{C}$
Operating Temperature	$T_{opr}$	-40 ~ +105	$^{\circ}\text{C}$
Junction Temperature	$T_J$	125	$^{\circ}\text{C}$
ESD (HBM)	$ESD_{HBM}$	2000	V
Assembly Temperature	$T_{sld}$	260	$^{\circ}\text{C}$

(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  $\mu\text{s}$

**Binning**

PC35R14

Product Specification

**Bin code definition**

V <sub>F</sub> Rank	Luminous Flux Rank	Wd Rank
A	S1	A1000

V <sub>F</sub> Rank	Condition	Min.	Max.
A	I <sub>F</sub> = 50 mA T <sub>j</sub> =25°C	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 Rank	Condition	Min. I <sub>v</sub> (mcd)	Max. I <sub>v</sub> (mcd)
S1	I <sub>F</sub> = 50 mA T <sub>j</sub> =25°C	1400	1800
S2		1800	2240
S3		2240	2800
S4		2800	3550
S5		3550	4260

**CIE Rank**

Wd Rank	Condition	(Min) λ(nm)	(Max) λ(nm)
A1000	I <sub>F</sub> = 50 mA T <sub>j</sub> =25°C	612	616
A2000		616	620
A3000		620	624

\* The Forward Voltage tolerance is ±0.05V

\* The luminous intensity tolerance is ± 8%

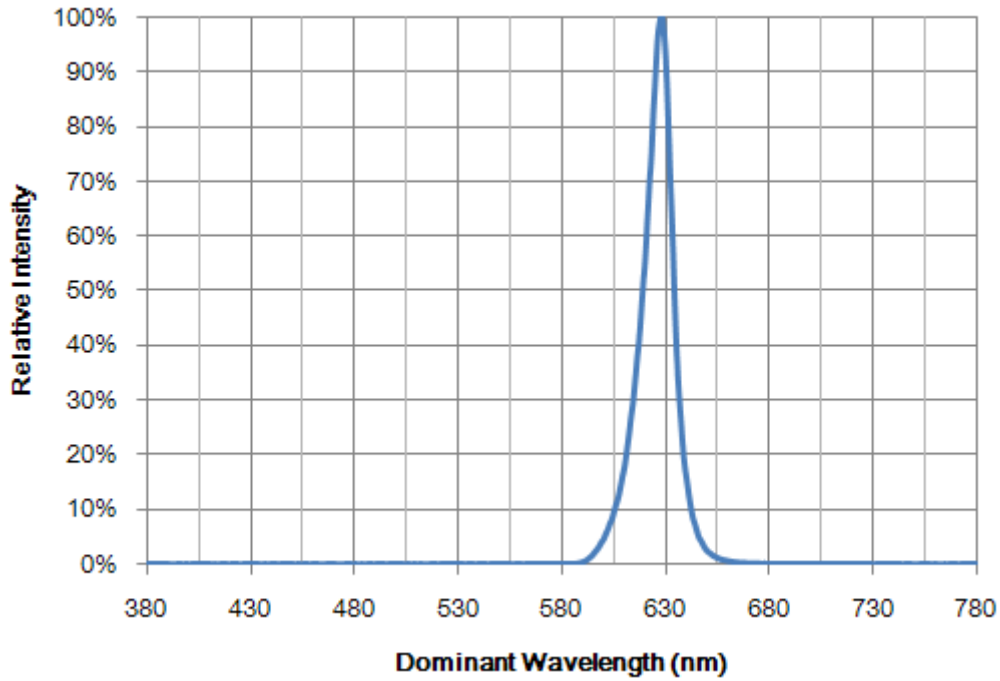
\* The Wavelength tolerance is ±0.5nm

## Characteristics

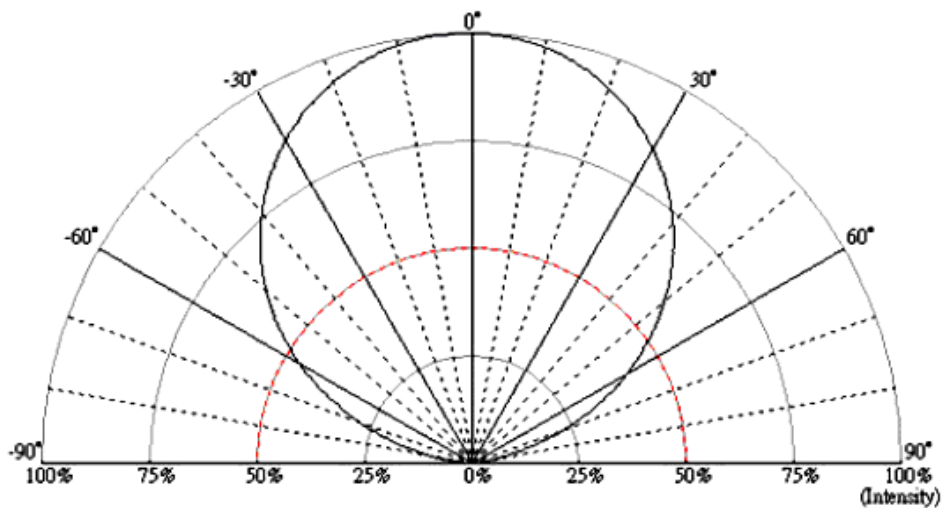
PC35R14

Product Specification

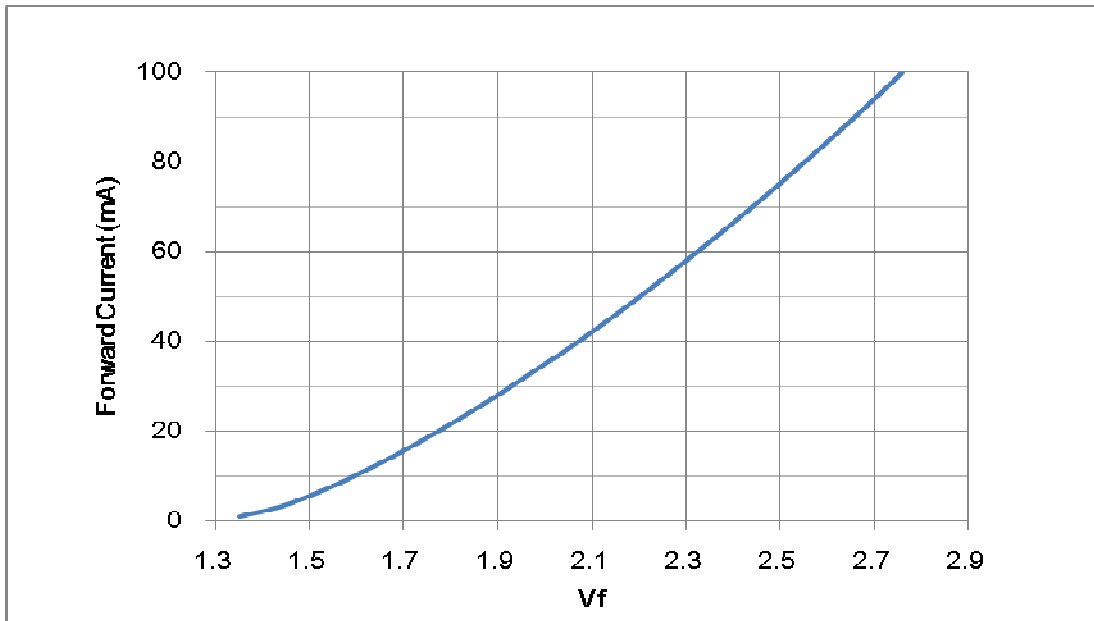
### ■ Spectrum



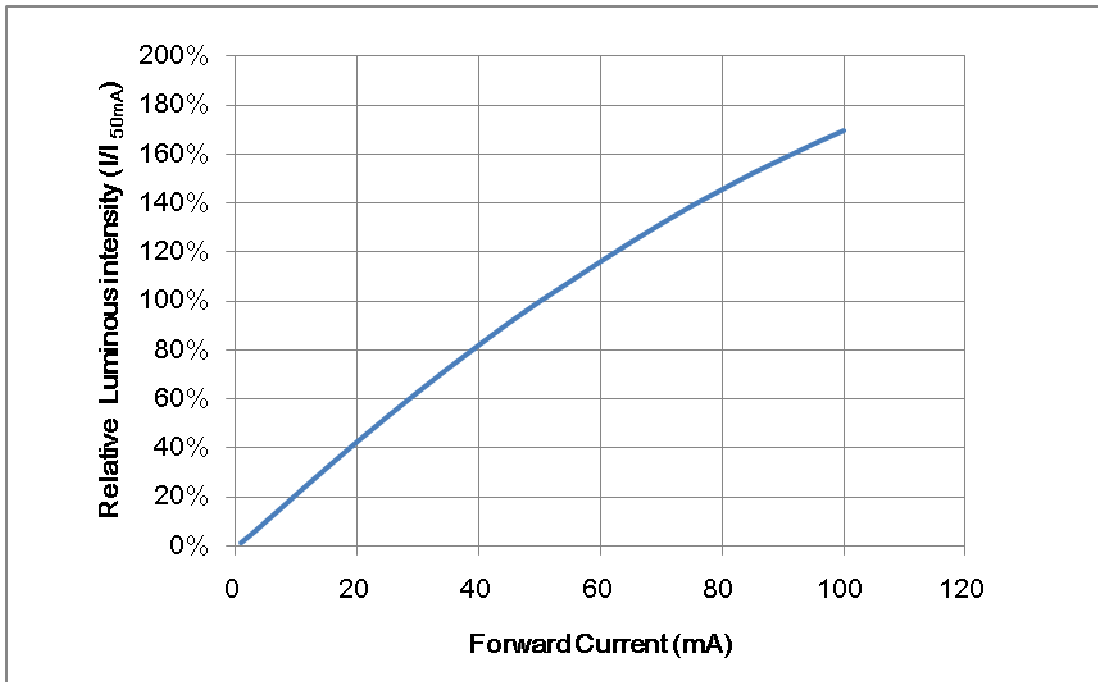
### ■ Radiation Pattern



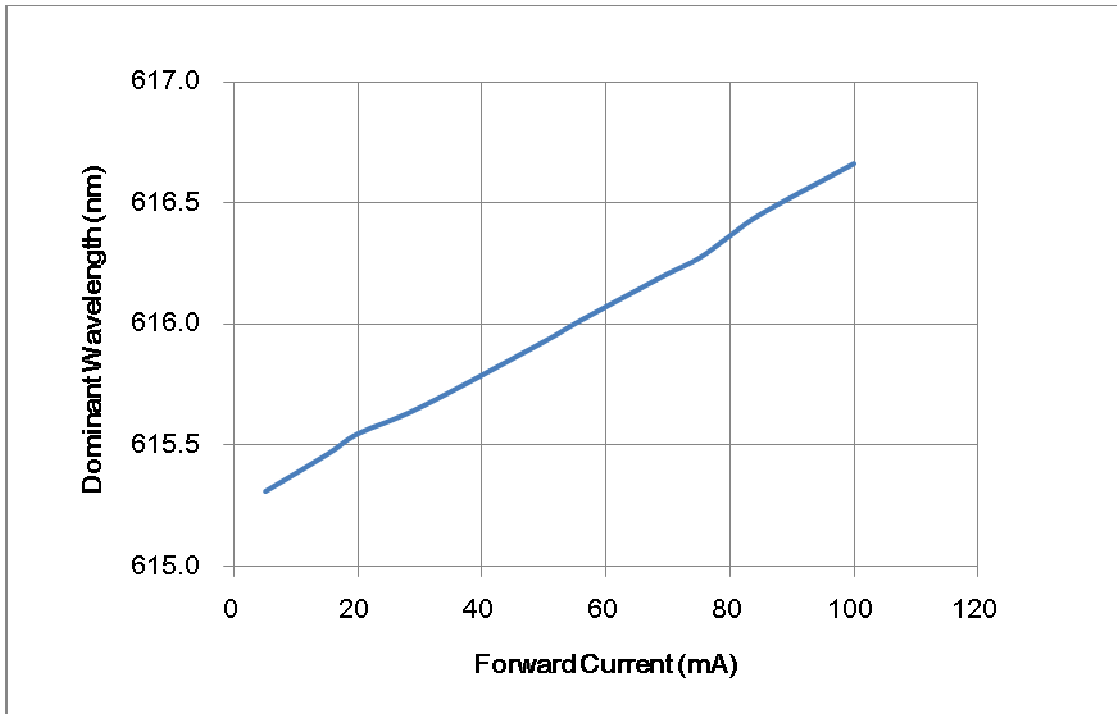
### ■ Forward Voltage vs. Forward Current



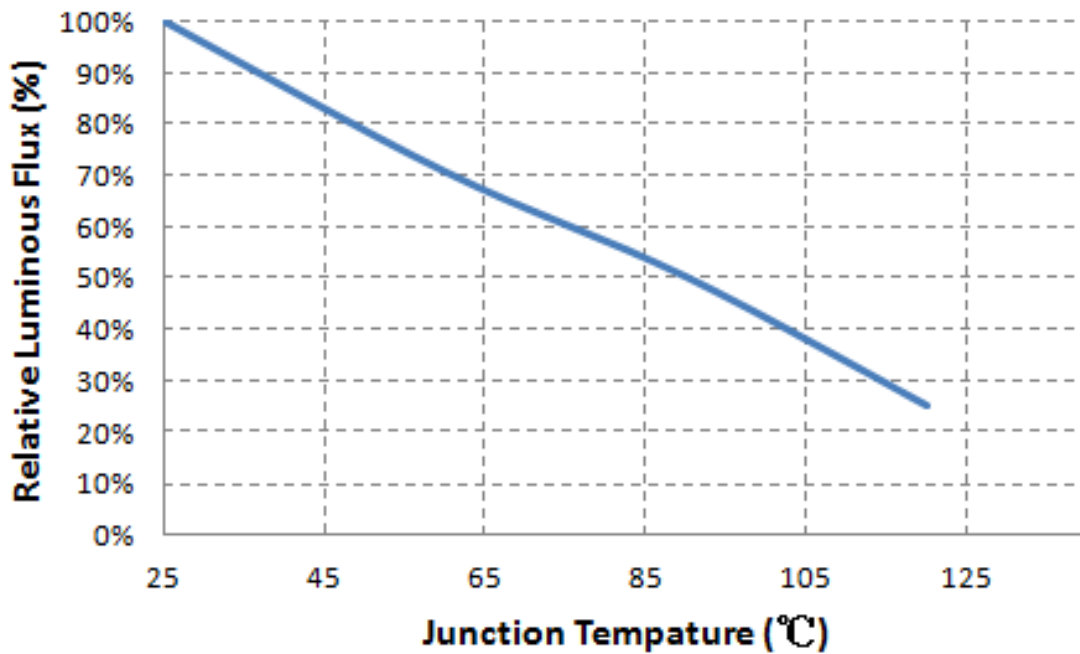
### ■ Forward Current vs. Relative Luminous Intensity



■ **Forward Current vs. Dominant Wavelength**

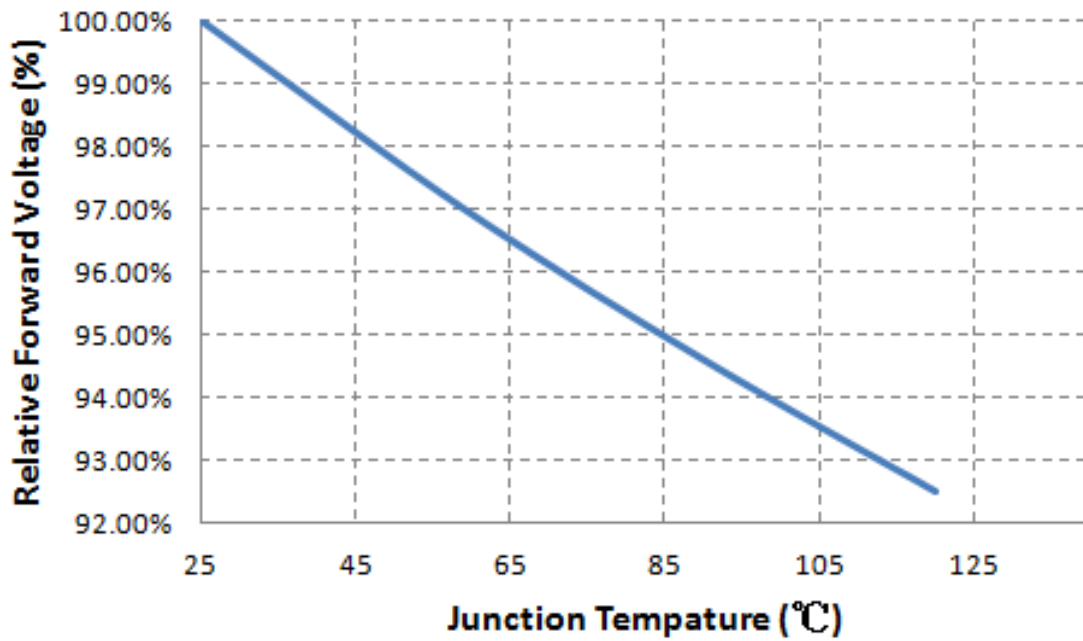


■ **Junction Temperature vs. Relative Luminance**

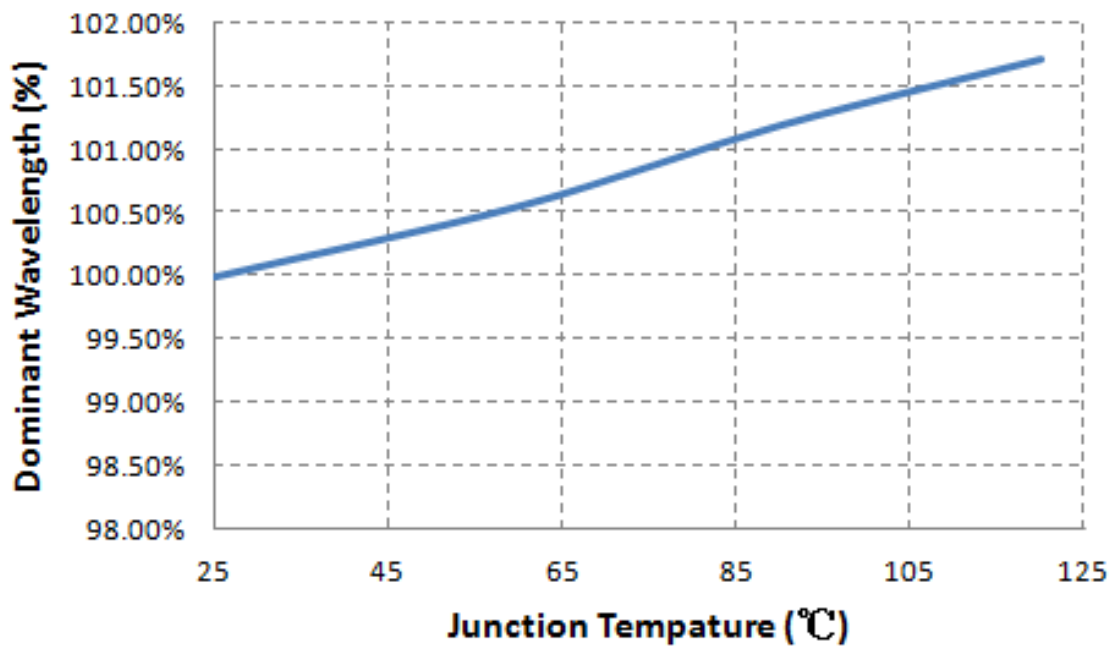




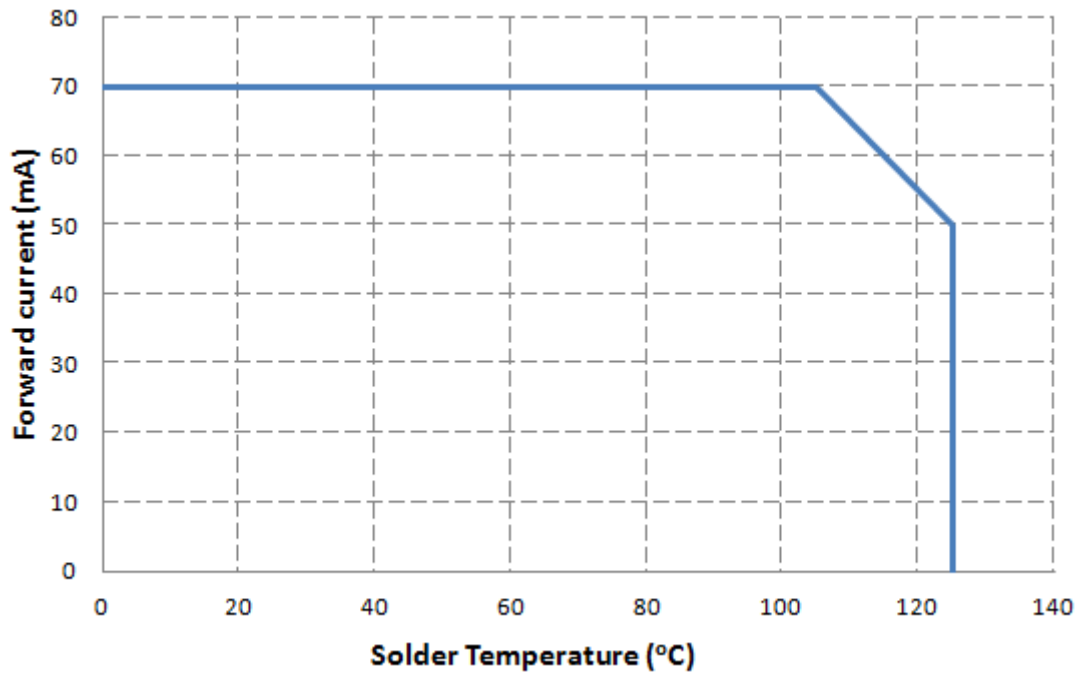
■ Junction Temperature vs. Forward Voltage Shift



■ Junction Temperature vs. Dominant Wavelength



■ **Derating Curve**



Reliability

PC35R14

Product Specification

**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	Temperature Cycle	AEC-Q101 Rev. D	-45°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 ~ 85 °C, IF=70mA, 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=70mA	1000 hours
8	Low Temperature Operating Life	JESD22-A108	TA=-40°C, IF=70mA	1000 hours
9	Temperature Humidity Operating Life	AEC-Q101 Rev. D	85°C, RH=85%, 1000hrs, IF=70mA	1000 hours
10	Electrostatic Discharges	AEC-Q101 Rev. D	HBM 2 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**

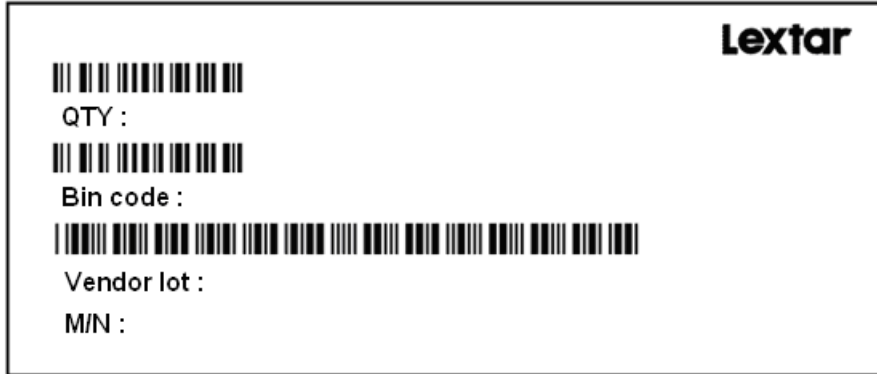
Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	V <sub>f</sub>	50mA	ΔV <sub>f</sub> < 10 %
Luminous Flux	I <sub>v</sub>	50mA	ΔI <sub>v</sub> < 20 %
Delta CIE	CIE-x ,CIE-y	50mA	Δx,y < 0.01

**Packing**

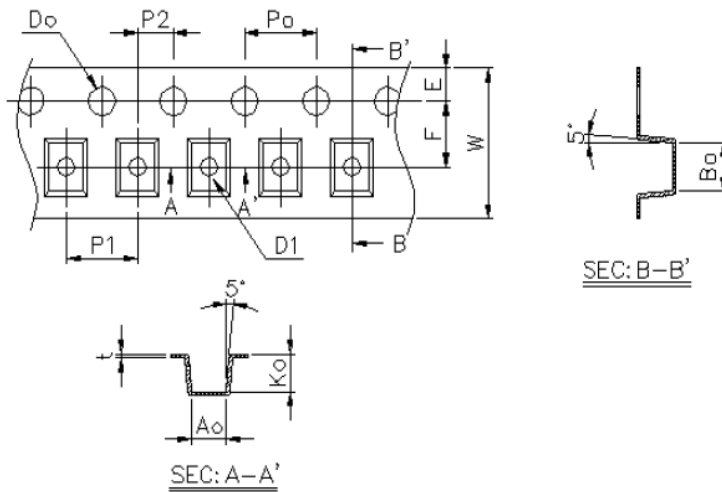
PC35R14

Product Specification

**Label**



**Carrier Taping**

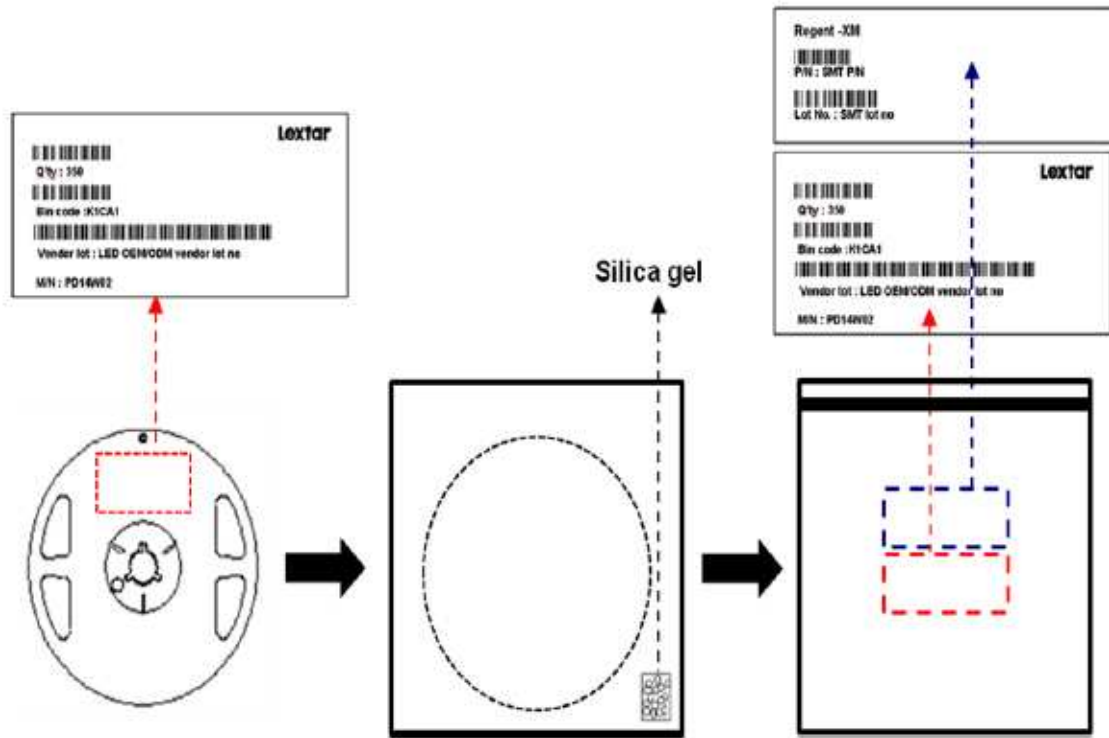


Item	Specification	Tol. (+/-)
W	<b>8.00</b>	$\pm 0.20$
E	<b>1.75</b>	$\pm 0.10$
F	<b>3.50</b>	$\pm 0.05$
D0	<b>1.50</b>	+0.10, -0
D1	<b>1.00</b>	$\pm 0.10$
P0	<b>4.00</b>	$\pm 0.05$
P1	<b>4.00</b>	$\pm 0.10$
P2	<b>2.00</b>	$\pm 0.05$
P0 x 10	<b>40.00</b>	$\pm 0.20$

t	<b>0.25</b>	$\pm 0.05$
A0	<b>3.00</b>	$\pm 0.10$
B0	<b>3.73</b>	$\pm 0.10$
K0	<b>2.12</b>	$\pm 0.10$
A1		
B1		
K1		

(Unit : mm)

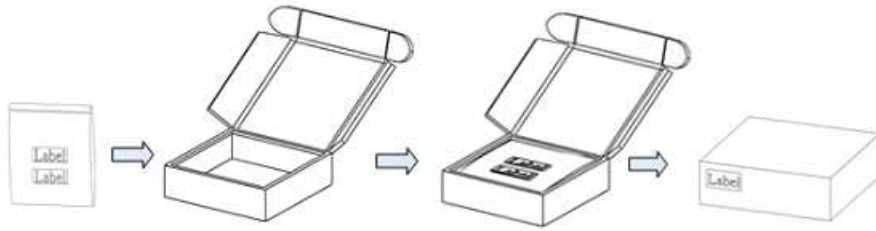
■ **Shield Bag Taping**



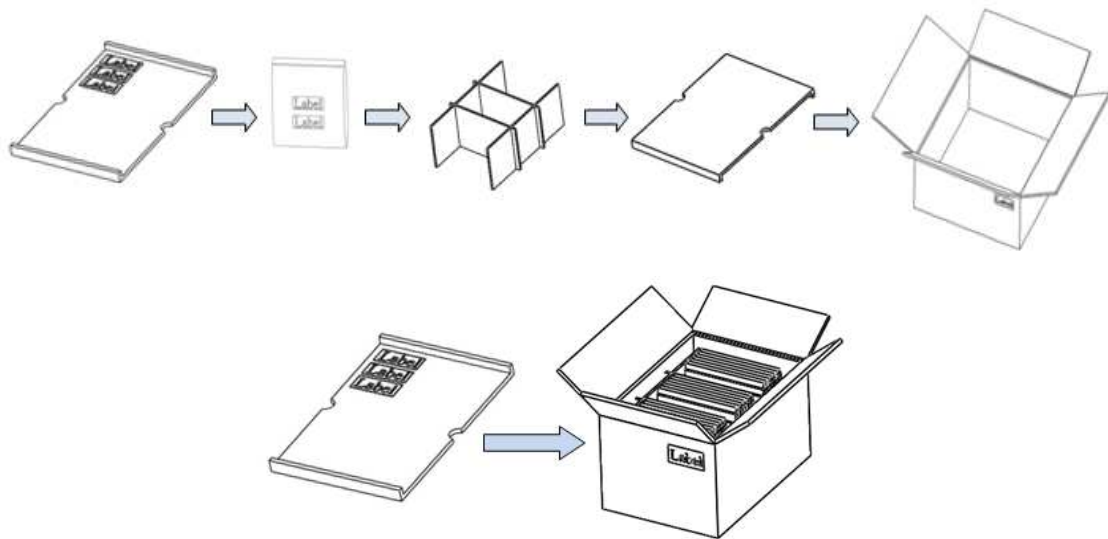
■ **Packing Box**

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

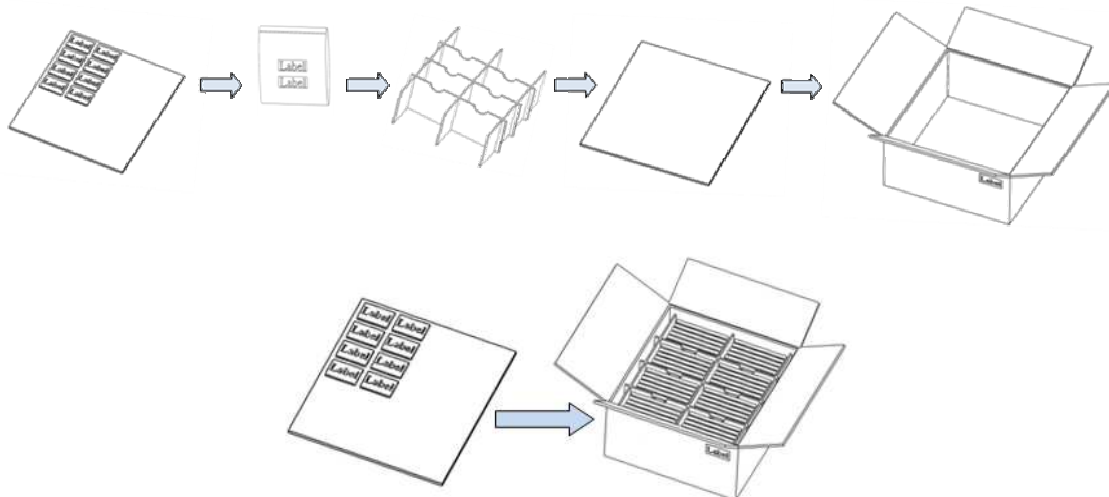
■ **Small Box**



■ **Medium Box**



■ **Large Box**



## Precautions

PC35R14

Product Specification

### ■ 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.

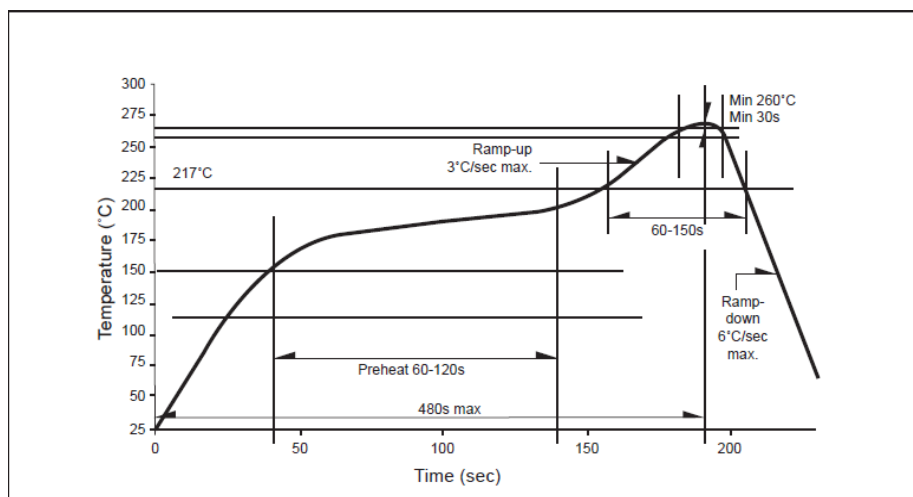
### ■ Storage

- 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.
- 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

PC35R14

Product Specification

Date	Contents	Writer	Approved
2017.01.03	NEW VERSION	Rudess	Rex
2017.05.03	Update packing reel Q'ty	Rudess	Bemore
2017.07.20	Update Features (Cu Alloy with Gold plated LF)	Bemore	Rex
2017.08.07	1. Update Reliability test – P.11 2. Soldering Notice and Conditions – P.15	Rudess	Bemore
2017.09.11	Update O.E. data – P.8~10	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.