

# Specification

**X42180-08**

## X42180-08

### Description

Z-Power series is designed for high current operation and high flux output applications.

Z-Power LED's thermal management perform exceeds other power LED solutions.

It incorporates state of the art SMD design and Thermal emission material.

Z Power LED is ideal light sources for general illumination applications, custom designed solutions, automotive large LCD backlights



## X42180-08

### Features

- Super high flux output and high luminance
- Designed for high current operation
- Low thermal resistance
- SMT solderability
- Lead free product
- RoHS compliant

### Applications

- Mobile phone flash
- Automotive interior / Exterior lighting
- Automotive signal lighting
- Torch
- Architectural lighting
- LCD TV / Monitor backlight
- Projector light source
- Traffic signals
- Task lighting
- Decorative/ Pathway lighting
- Remote / Solar powered lighting
- Household appliances

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## 1. Full code of X42180-08 series

Full code form :  $X_1 X_2 X_3 - X_4 X_5 - X_6 X_7 - X_8 X_9$

### 1. Part Number

$X_1$	Company
$X_2$	
$X_3$	Z-Power LED series number
$X_4$	Chip quantity (or Power Dissipation)
$X_5$	Package outline size
$X_6$	Type of PCB
$X_7$	Grade of characteristic code

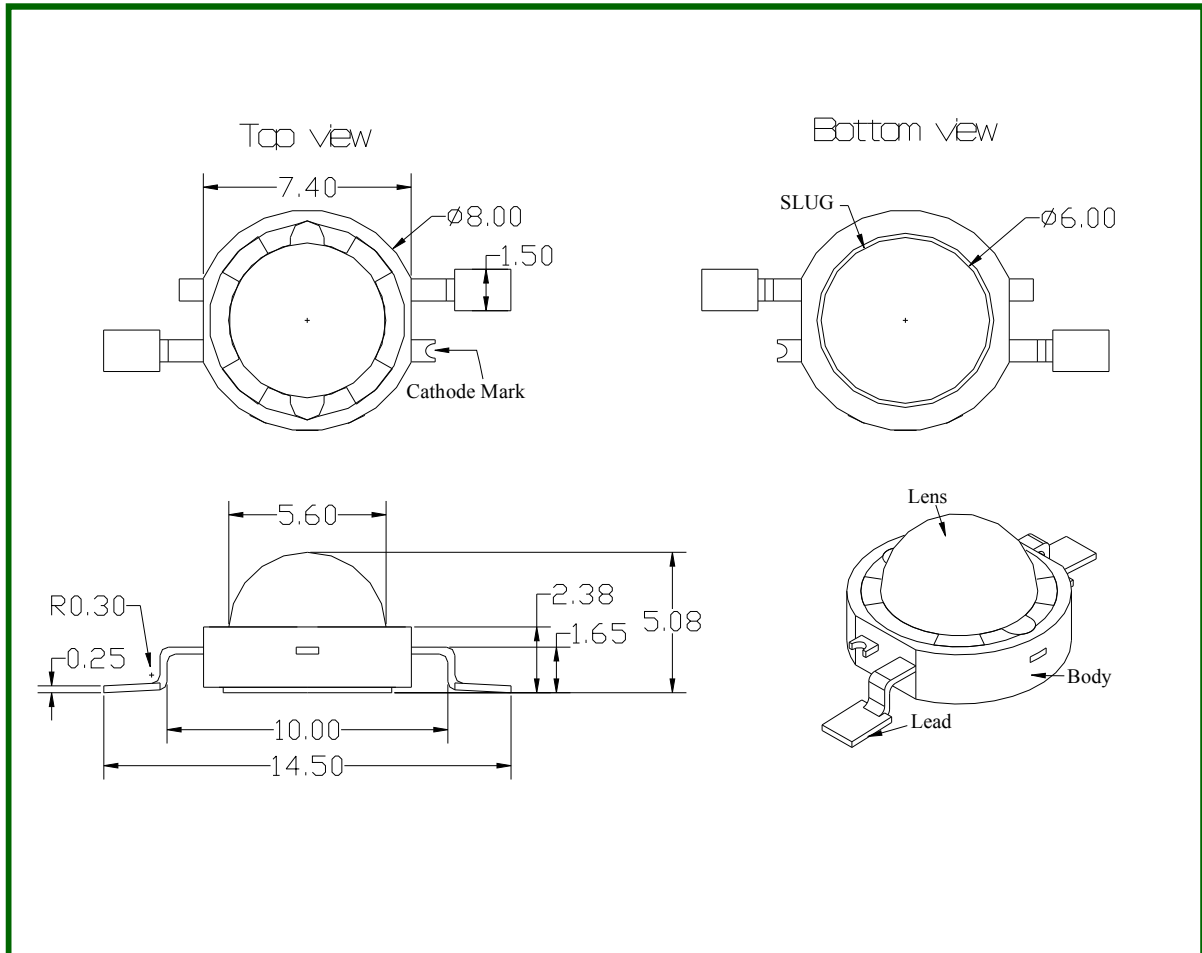
### 2. Internal Number

$X_8 / X_9$	Revision No.
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### 3. Code Labeling

$X_{10}$	Luminous flux (or Radiant flux for royal blue)
$X_{11}, X_{12}, X_{13} X_{14}$	Dominant wavelength (or x,y coordinates rank code)
$X_{14}$	Forward voltage

## 2. Outline dimensions



**Notes :**

1. All dimensions are in millimeters. (tolerance :  $\pm 0.2$  )
2. Scale : none
3. Slug of package is connected to anode.

\* The appearance and specifications of the product may be changed for improvement without notice.

### 3. Characteristics of X42180-08

Pure White (W42180-08)

#### 1-1 Electro-Optical characteristics at 350mA

(Ta=25°C, RH30%)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	$\Phi_V$ [2]	-	110	-	lm
	$\Phi_V$ (Tj=100°C)	-	94	-	
Correlated Color Temperature [3]	CCT	-	6000	-	K
CRI	R <sub>a</sub>	-	70	-	-
Forward Voltage [4]	V <sub>F</sub>	-	3.3	-	V
Thermal resistance (J to S)	R $\theta_{J-S}$		6.2		K/W
View Angle	2 $\theta$ 1/2		123		deg.

#### 1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I <sub>F</sub>	1000	mA
		1500(1/10duty@1kHz)	
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>d</sub>	4	W
Junction Temperature	T <sub>j</sub>	145(@ I <sub>F</sub> ≤ 1000mA)	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
ESD Sensitivity [5]	-	±8,000V HBM	-

\*Notes :

- [1] SSC maintains a tolerance of ±10% on flux and power measurements.
- [2]  $\Phi_V$  is the total luminous flux output as measured with an integrating sphere.
- [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.  
Color coordinate : 0.005, CCT ±5% tolerance.
- [4] Tolerance is ±0.06V on forward voltage measurements
- [5] A zener diode is included to protect the product from ESD.

## Characteristics of X42180-08

### Neutral White (S42180-08)

#### 1-1 Electro-Optical characteristics at 350mA

(Ta=25°C, RH30%)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	$\Phi_V$ [2]	-	88	-	lm
	$\Phi_V$ (Tj=100°C)	-	74	-	
Correlated Color Temperature [3]	CCT	-	4000	-	K
CRI	R <sub>a</sub>	-	91	-	-
Forward Voltage [4]	V <sub>F</sub>	-	3.3	-	V
Thermal resistance (J to S)	R $\theta_{J-S}$		6.2		K/W
View Angle	2 $\theta$ 1/2		123		deg.

#### 1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I <sub>F</sub>	700	mA
		1000(1/10duty@1kHz)	
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>d</sub>	4	W
Junction Temperature	T <sub>j</sub>	145(@ I <sub>F</sub> ≤ 1000mA)	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
ESD Sensitivity [5]	-	±8,000V HBM	-

\*Notes :

- [1] SSC maintains a tolerance of ±10% on flux and power measurements.
- [2]  $\Phi_V$  is the total luminous flux output as measured with an integrating sphere.
- [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.  
Color coordinate : 0.005, CCT ±5% tolerance.
- [4] Tolerance is ±0.06V on forward voltage measurements
- [5] A zener diode is included to protect the product from ESD.

## Characteristics of X42180-08

Neutral White (S42180H-08)

### 1-1 Electro-Optical characteristics at 350mA

(Ta=25°C, RH30%)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	$\Phi_V$ [2]	-	98	-	lm
	$\Phi_V$ (Tj=100°C)	-	84	-	
Correlated Color Temperature [3]	CCT	-	4000	-	K
CRI	R <sub>a</sub>	-	80	-	-
Forward Voltage [4]	V <sub>F</sub>	-	3.3	-	V
Thermal resistance (J to S)	R $\theta_{J-S}$		6.2		K/W
View Angle	2 $\theta$ 1/2		123		deg.

### 1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I <sub>F</sub>	700	mA
		1000(1/10duty@1kHz)	
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>d</sub>	4	W
Junction Temperature	T <sub>j</sub>	145(@ I <sub>F</sub> ≤ 1000mA)	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
ESD Sensitivity [5]	-	±8,000V HBM	-

\*Notes :

- [1] SSC maintains a tolerance of ±10% on flux and power measurements.
- [2]  $\Phi_V$  is the total luminous flux output as measured with an integrating sphere.
- [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.  
Color coordinate : 0.005, CCT ±5% tolerance.
- [4] Tolerance is ±0.06V on forward voltage measurements
- [5] A zener diode is included to protect the product from ESD.



## Characteristics of X42180-08

### Warm White (N42180-08)

#### 1-1 Electro-Optical characteristics at 350mA

(Ta=25°C, RH30%)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	$\Phi_V$ [2]	-	84	-	lm
	$\Phi_V$ (Tj=100°C)	-	71	-	
Correlated Color Temperature [3]	CCT	-	3000	-	K
CRI	R <sub>a</sub>	-	91	-	-
Forward Voltage [4]	V <sub>F</sub>	-	3.3	-	V
Thermal resistance (J to S)	R $\theta_{J-S}$		6.2		K/W
View Angle	2 $\theta$ 1/2		123		deg.

#### 1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I <sub>F</sub>	700	mA
		1000(1/10duty@1kHz)	
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>d</sub>	4	W
Junction Temperature	T <sub>j</sub>	145(@ I <sub>F</sub> ≤ 1000mA)	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
ESD Sensitivity [5]	-	±8,000V HBM	-

\*Notes :

[1] SSC maintains a tolerance of ±10% on flux and power measurements.

[2]  $\Phi_V$  is the total luminous flux output as measured with an integrating sphere.

[3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

Color coordinate : 0.005, CCT ±5% tolerance.

[4] Tolerance is ±0.06V on forward voltage measurements

[5] A zener diode is included to protect the product from ESD.

## Characteristics of X42180-08

Warm White (N42180H-08)

### 1-1 Electro-Optical characteristics at 350mA

(Ta=25°C, RH30%)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	$\Phi_V$ [2]	-	93	-	lm
	$\Phi_V$ (Tj=100°C)	-	78	-	
Correlated Color Temperature [3]	CCT	-	3000	-	K
CRI	R <sub>a</sub>	-	80	-	-
Forward Voltage [4]	V <sub>F</sub>	-	3.3	-	V
Thermal resistance (J to S)	R $\theta_{J-S}$		6.2		K/W
View Angle	2 $\theta$ 1/2		123		deg.

### 1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I <sub>F</sub>	700	mA
		1000(1/10duty@1kHz)	
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>d</sub>	4	W
Junction Temperature	T <sub>j</sub>	145(@ I <sub>F</sub> ≤ 1000mA)	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
ESD Sensitivity [5]	-	±8,000V HBM	-

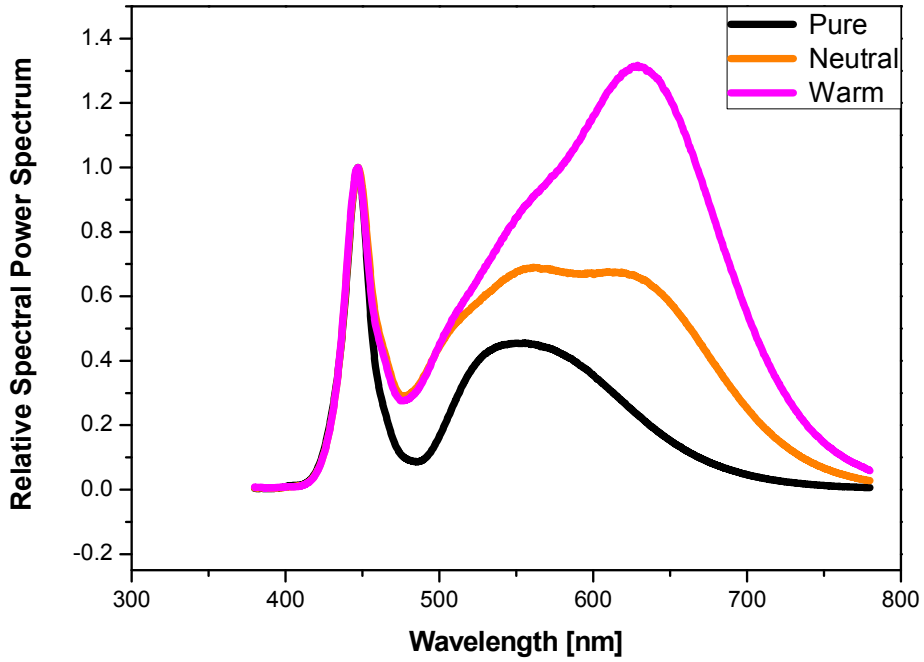
\*Notes :

- [1] SSC maintains a tolerance of ±10% on flux and power measurements.
- [2]  $\Phi_V$  is the total luminous flux output as measured with an integrating sphere.
- [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.  
Color coordinate : 0.005, CCT ±5% tolerance.
- [4] Tolerance is ±0.06V on forward voltage measurements
- [5] A zener diode is included to protect the product from ESD.

## 4. Characteristic diagrams

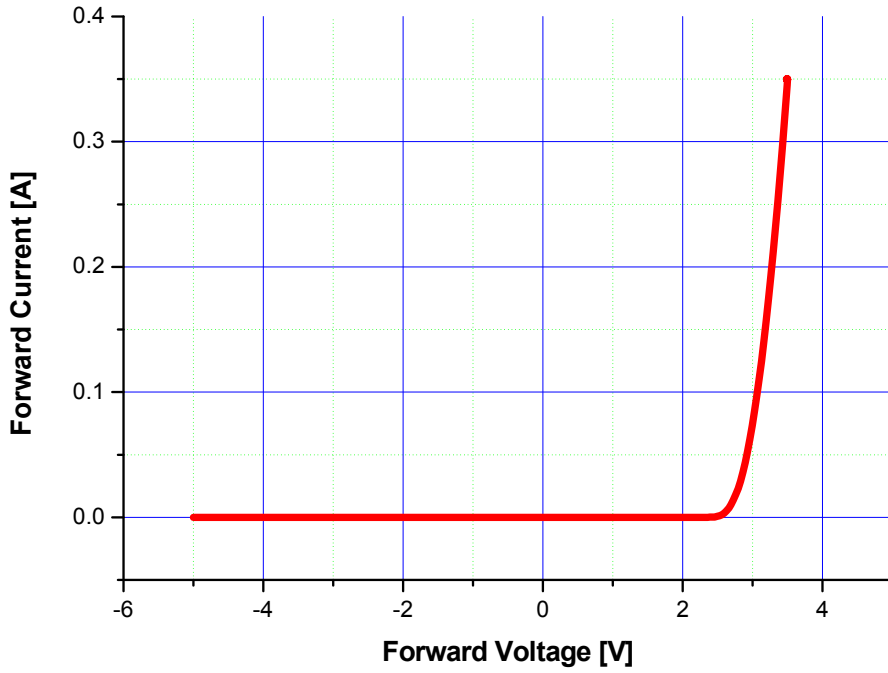
### Color Spectrum

(IF=350mA, Ta=25°C, RH30%)

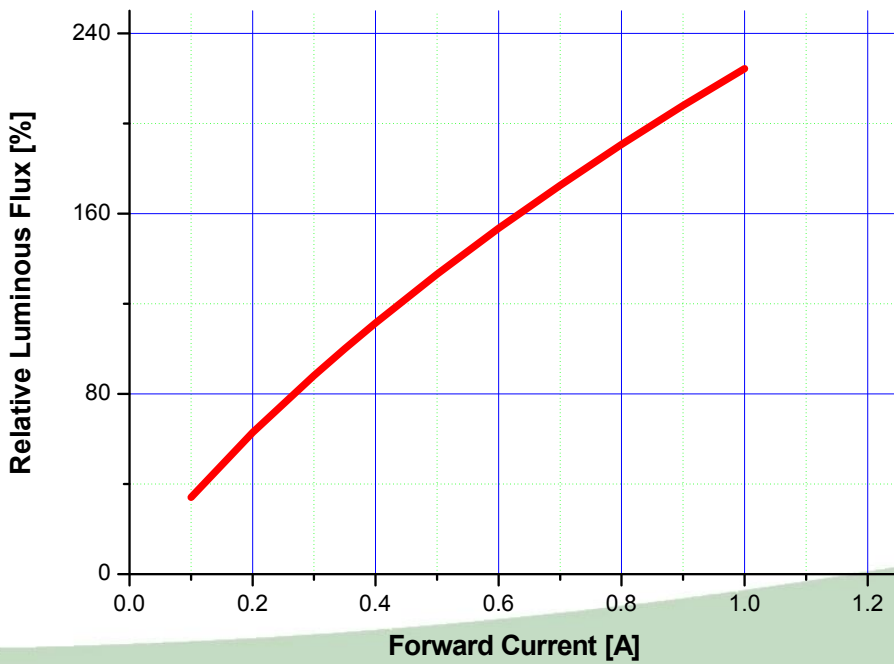


**Forward Current Characteristics**

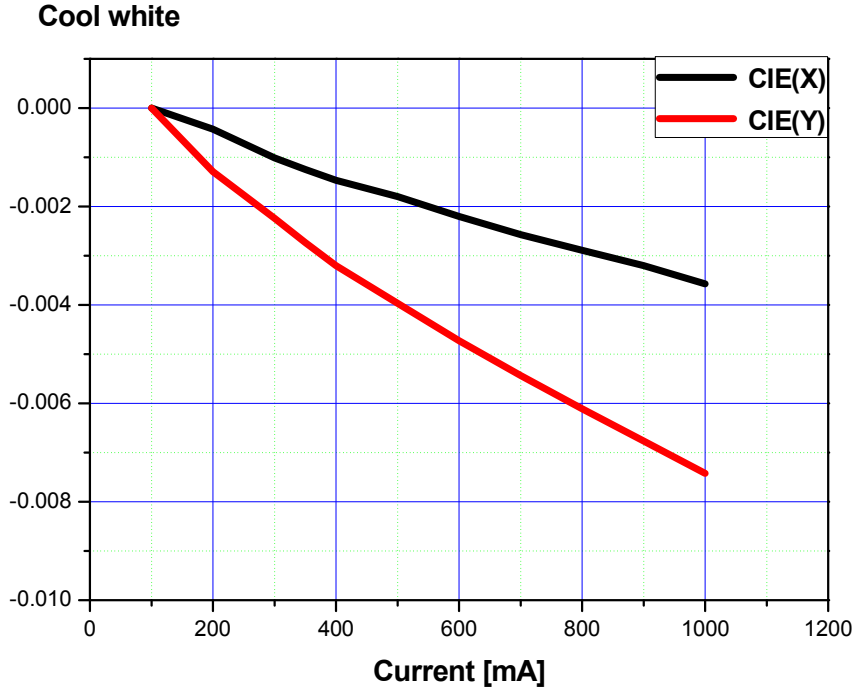
**Forward Voltage vs. Forward Current, Ta=25°C**



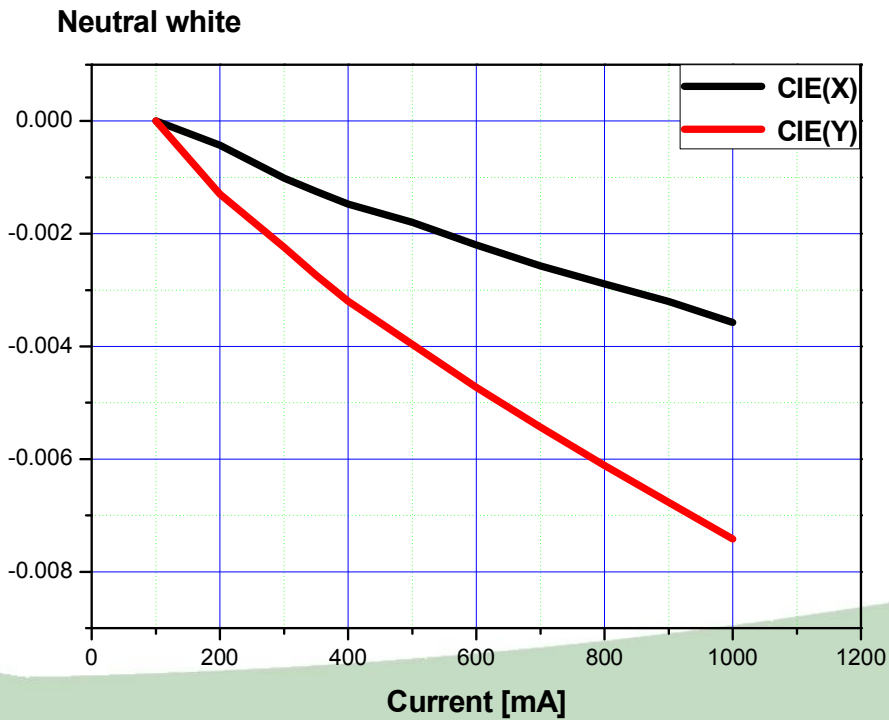
**Forward Current vs. Normalized Relative Luminous Flux, Ta=25°C..**



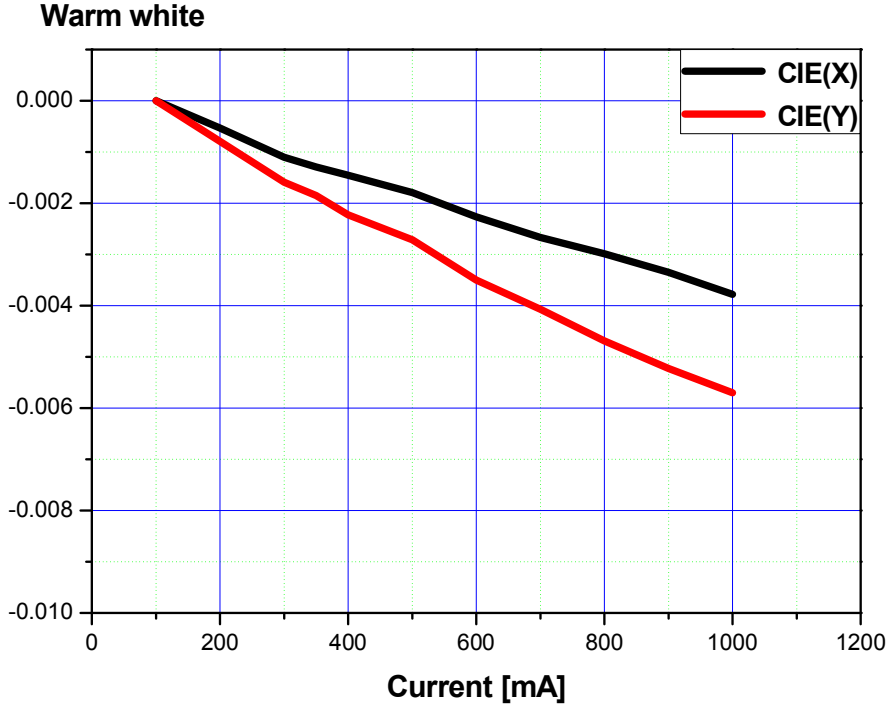
**Chromaticity Coordinate vs. Forward Current, Ta=25 °C (Cool white)**



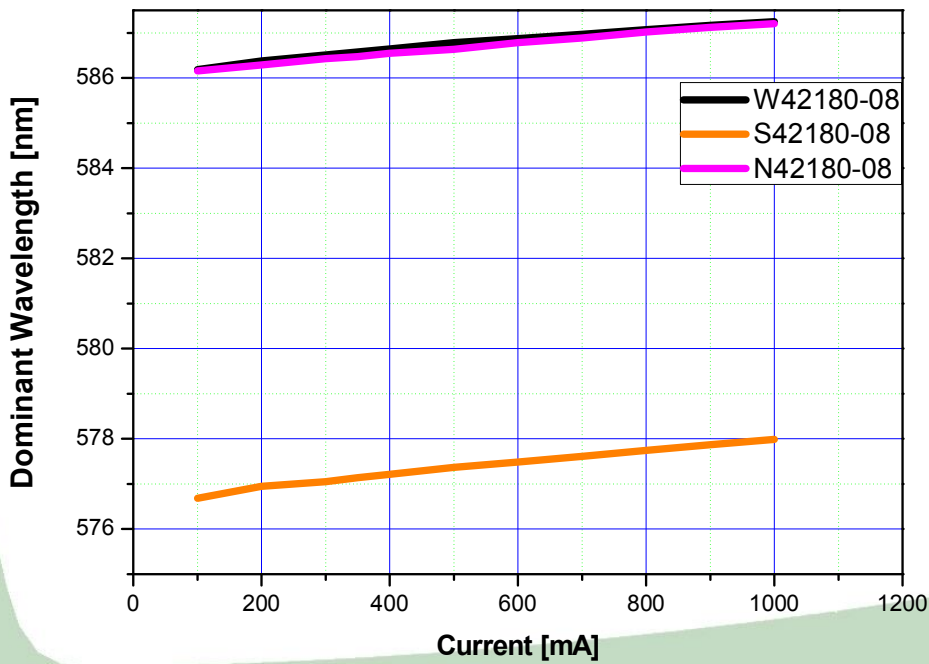
**Chromaticity Coordinate vs. Forward Current, Ta=25 °C (Neutral white)**



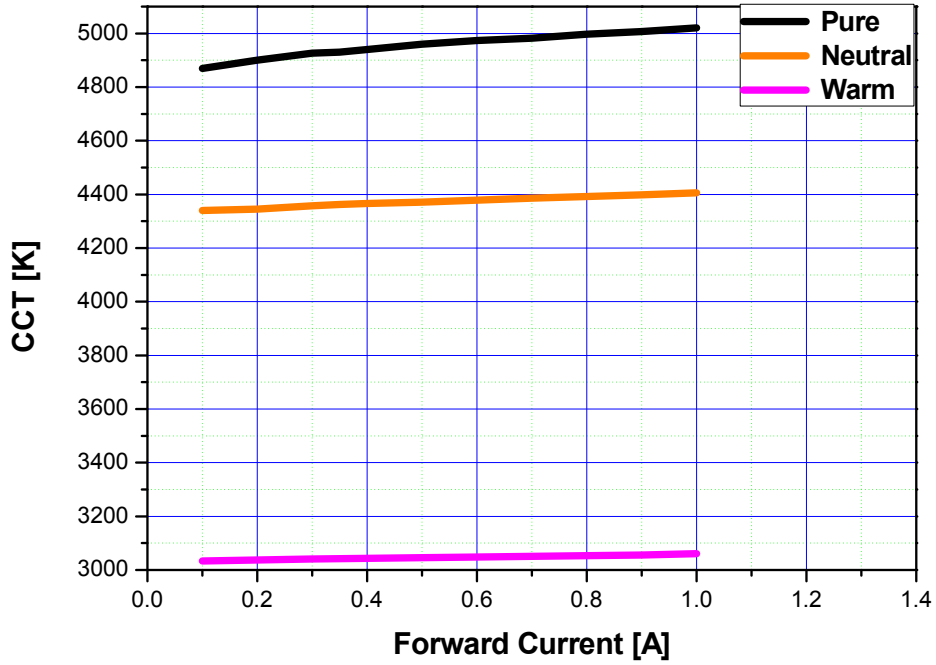
**Chromaticity Coordinate vs. Forward Current, Ta=25°C (Warm white)**



**Wavelength vs. Forward Current, Ta=25°C**

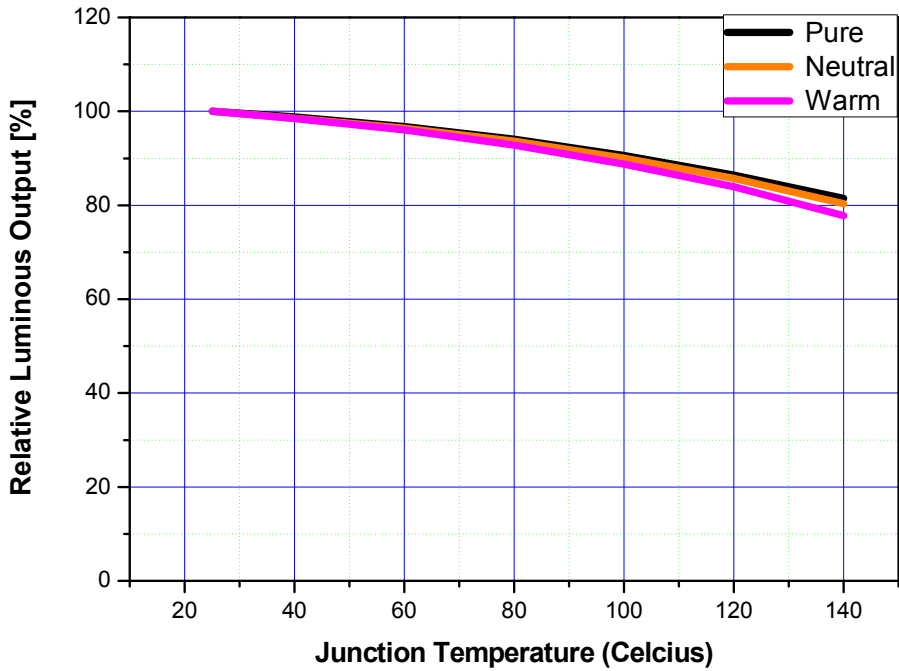


**CCT vs. Forward Current, Ta=25°C**

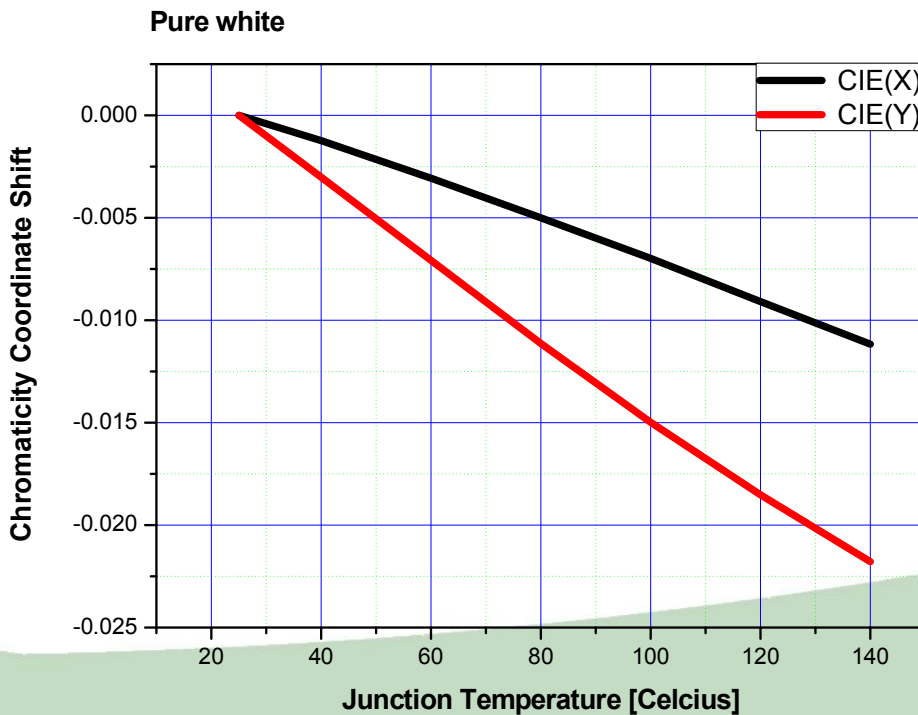


### Junction Temperature Characteristics

**Relative Light Output vs. Junction Temperature at IF=350mA**

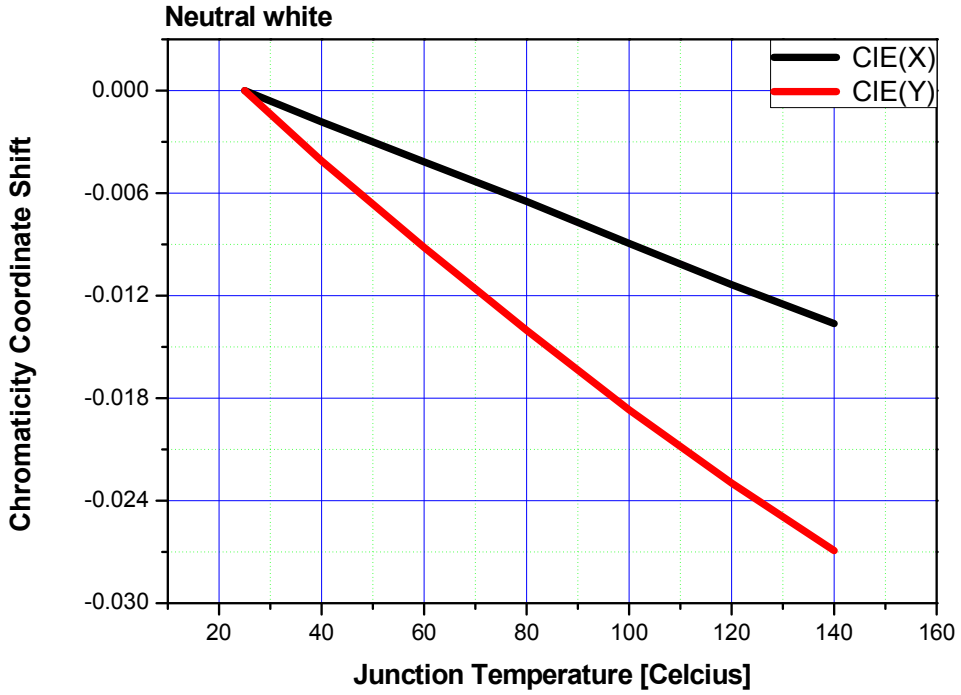


**Chromaticity Coordinate vs. Junction Temperature at IF=350mA (Pure white)**

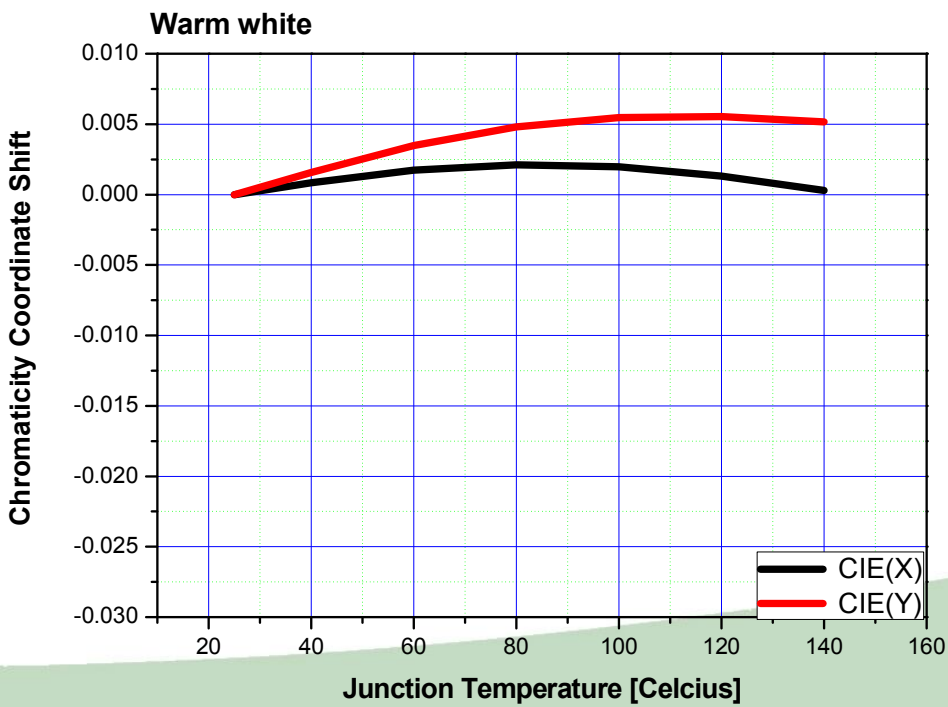




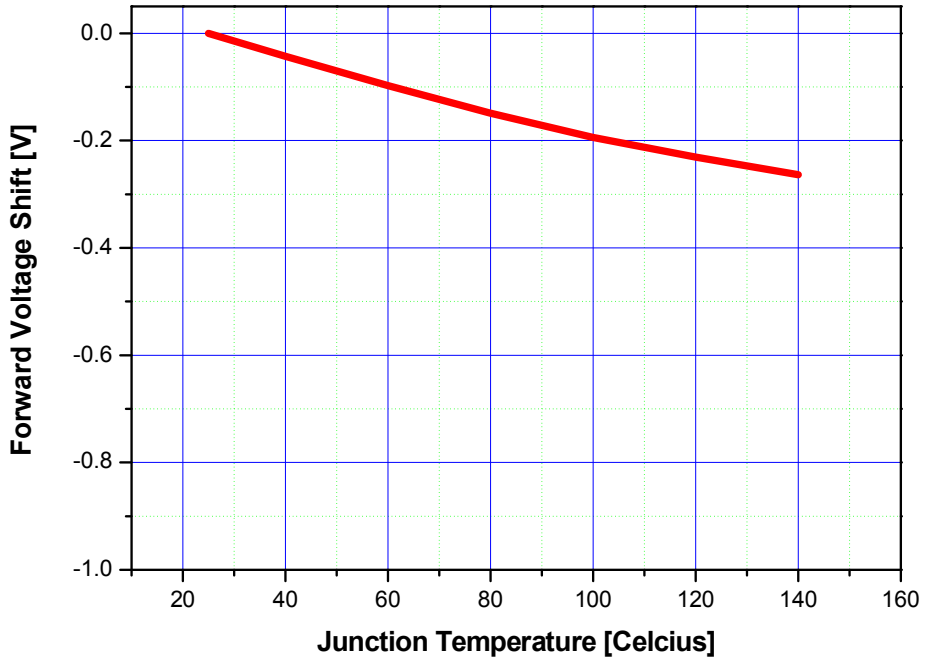
**Chromaticity Coordinate vs. Junction Temperature at IF=350mA (Neutral white)**



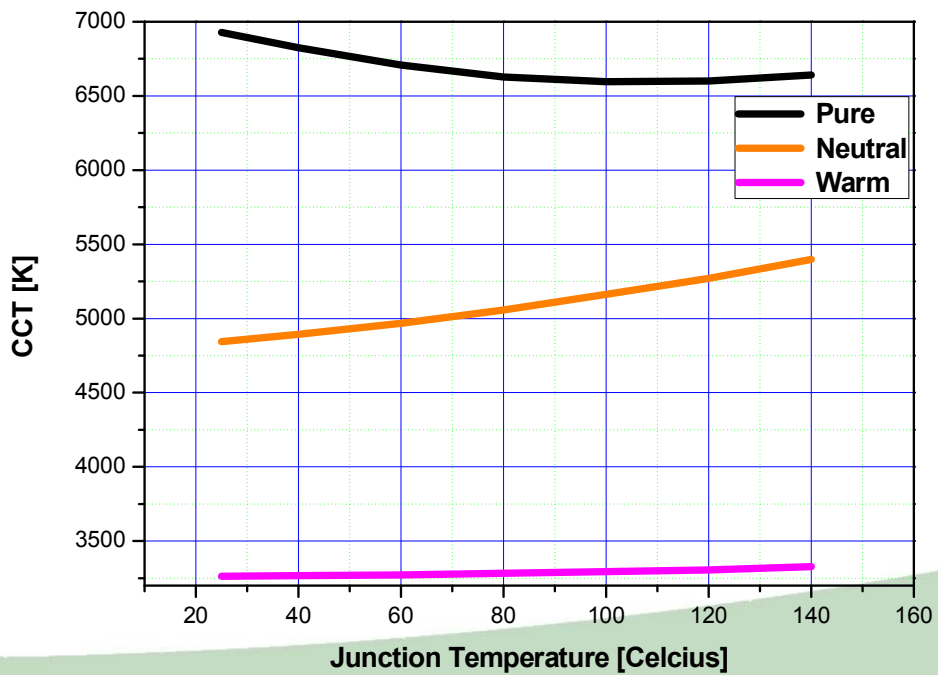
**Chromaticity Coordinate vs. Junction Temperature at IF=350mA (Warm white)**



**VF vs. Junction Temperature at IF=350mA**

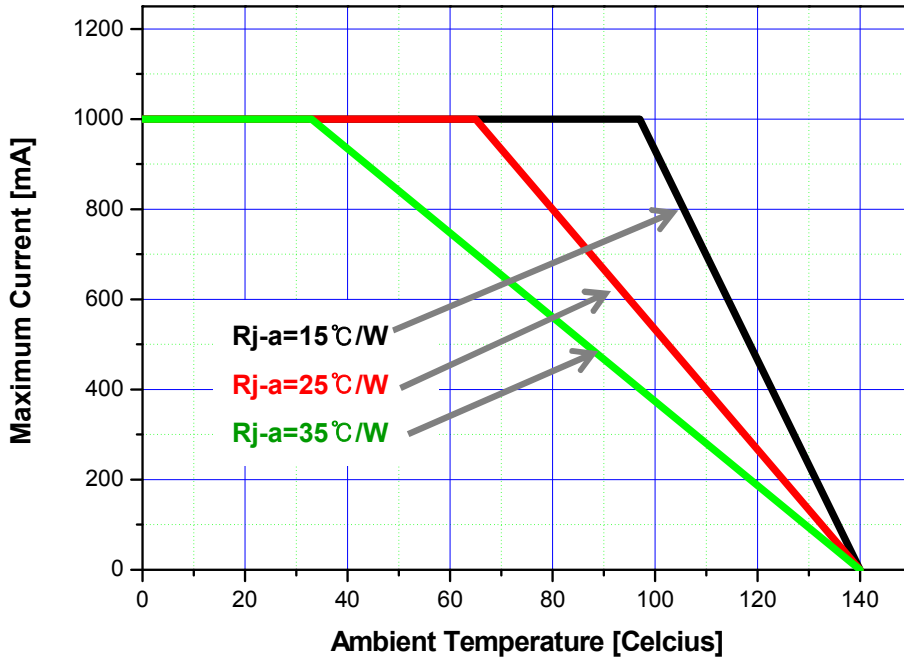


**CCT vs. Junction Temperature at IF=350mA**

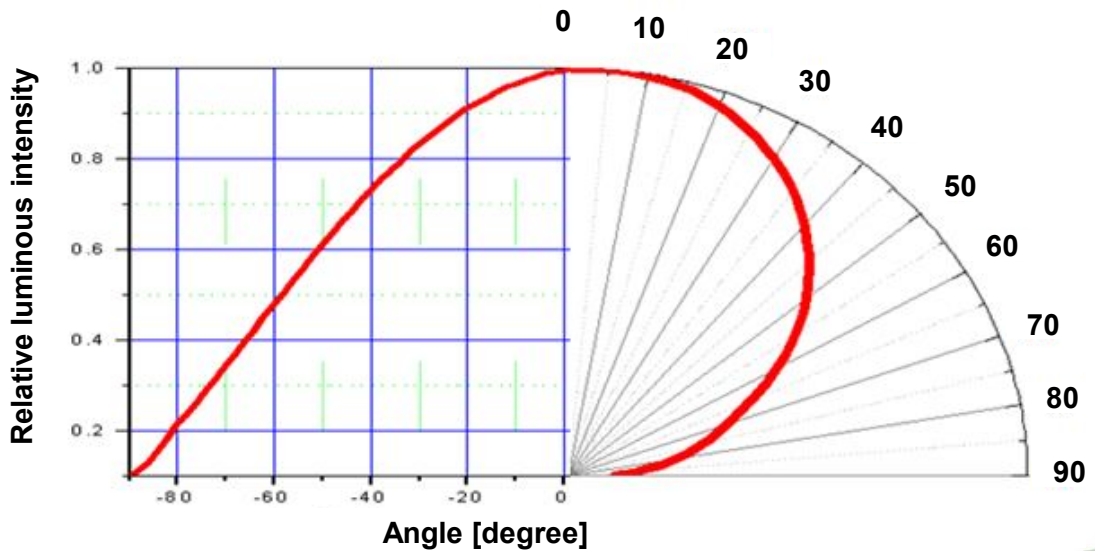


**Characteristic diagrams**

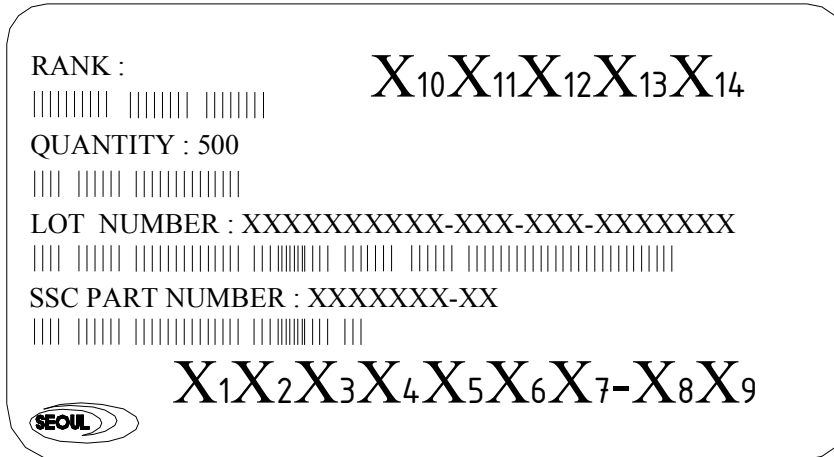
**Ambient Temperature vs. Allowable Forward Current**  
Pure White, Neutral White, Warm White ( $T_{jmax} = 145^{\circ}C, @1A$ )



**Radiation pattern at 350mA**



## 5. Labeling



### Full code form :

#### 1. Part Number

- X<sub>1</sub> : Color
- X<sub>2</sub> : Z-Power LED series number
- X<sub>3</sub> : LENS type
- X<sub>4</sub> : Chip quantity (or Power Dissipation)
- X<sub>5</sub> : Package outline size
- X<sub>6</sub> : Type of PCB
- X<sub>7</sub> : Grade of characteristic code

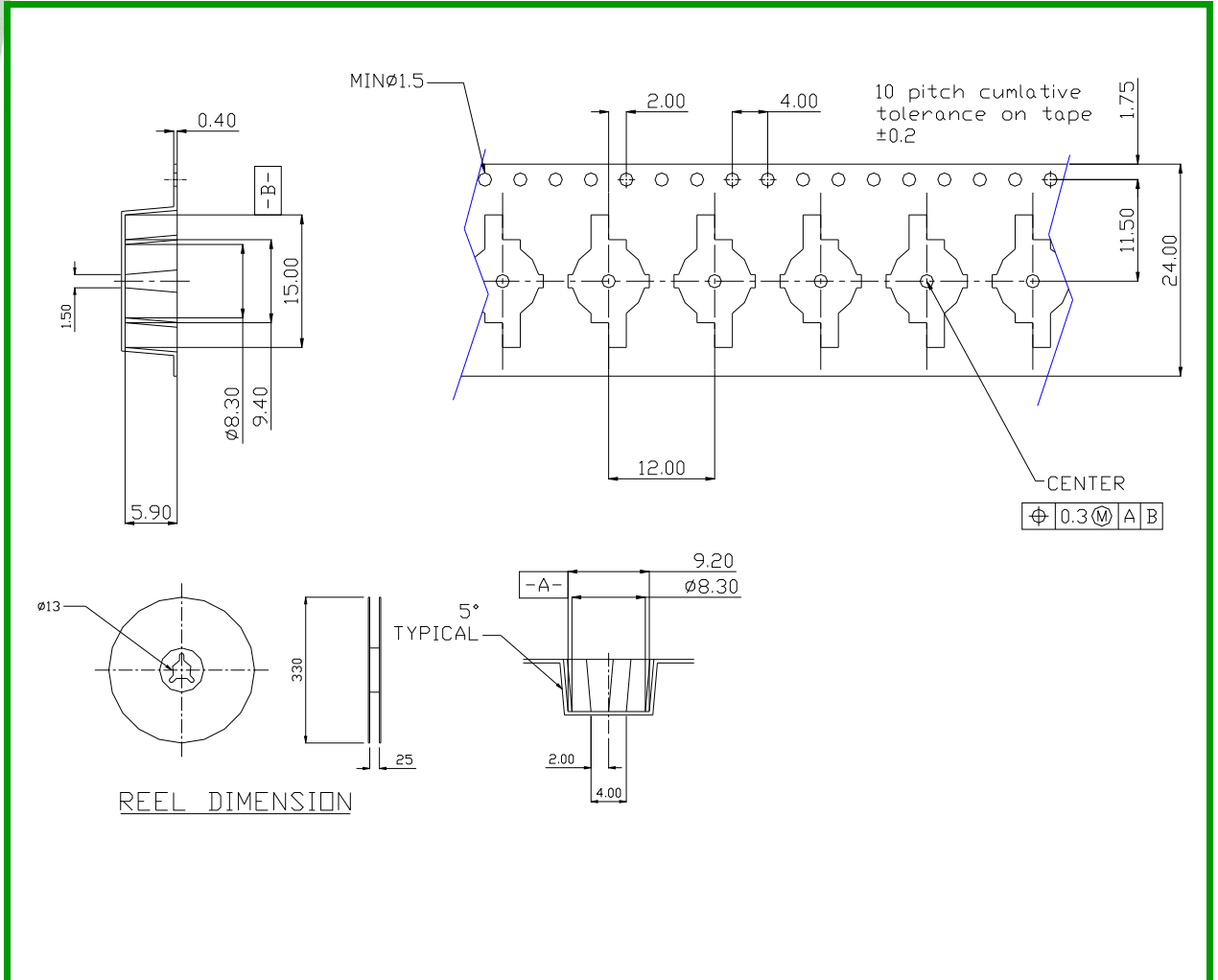
#### 2. Internal Number

- X<sub>8</sub>, X<sub>9</sub> : Revision No.

#### 3. Code Labeling

- X<sub>10</sub> : Luminous flux (or Radiant flux for royal blue)
- X<sub>11</sub> X<sub>12</sub> X<sub>13</sub> : Dominant wavelength (or x,y coordinates rank code)
- X<sub>14</sub> : Forward voltage

## 6. Packaging



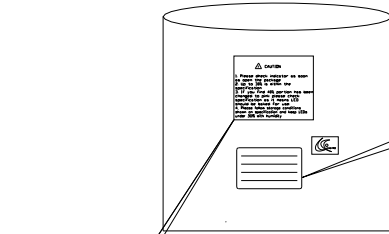
**Note :**

1. The number of loaded products in the reel is 500ea
2. All dimensions are in millimeters (tolerance :  $\pm$ 0.2 )
3. Scale none

**\*The appearance and specifications of the product may be changed for improvement without notice.**

**Packaging**

Aluminum Vinyl Bag

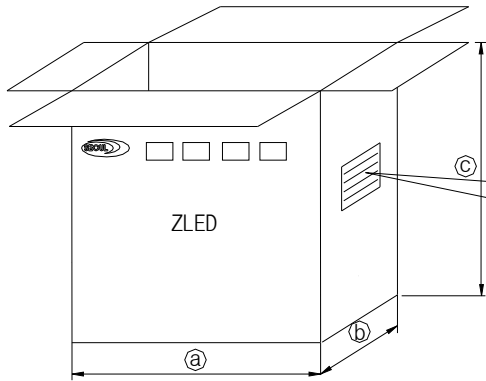


PART NO. : #####-##  
 QUANTITY : \*\*\*  
 LOT NUMBER : #####-#####  
 BIN CODE : #####

⚠ CAUTION

1. Please check indicator as soon as open the package
2. Up to 30% is within the specification
3. If you find 40% portion has been changed to pink please check specification as it means LED should be baked for use.
4. Please follow storage conditions shown on specification and keep LEDs under 30% with humidity

Outer Box



TYPE	SIZE (mm)		
	a	b	c
	350	350	370

ZLED

PART : W42180-\*\*  
 PO CODE : ##  
 QYT : #####  
 LOT NO : YMDD-#####  
 DATE : #####

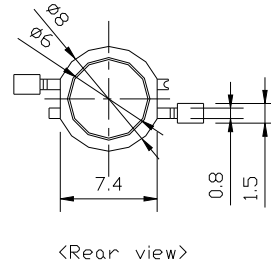
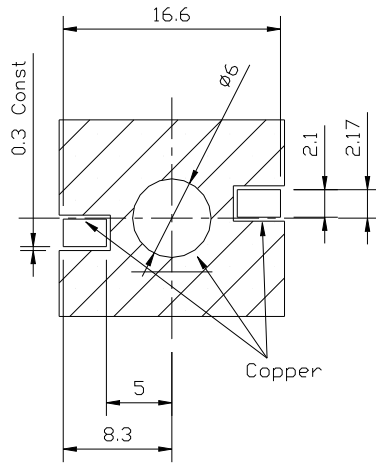
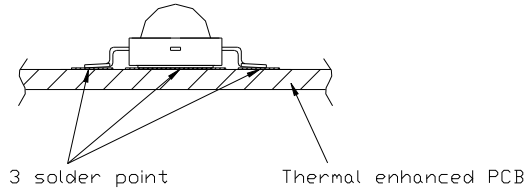
SEOUL SEMICONDUCTOR CO.,LTD

**Note :**

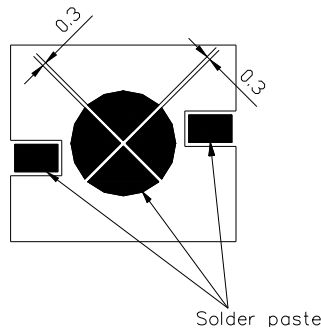
1. 6~10 reels are loaded in box
2. Scale none
3. For more information about binning and labeling, refer to the Application Note - 1

## 7. Recommended solder pad

### 1. Solder pad



### 2. Solder paste pattern



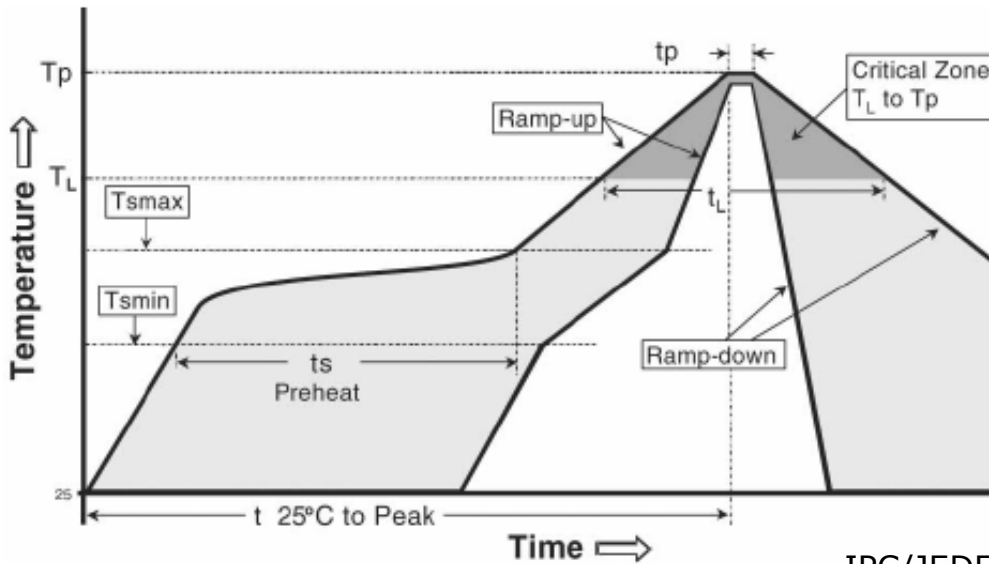
**Note :**

1. All dimensions are in millimeters (tolerance :  $\pm 0.2$  )

2. Scale none

\*The appearance and specifications of the product may be changed for improvement without notice.

## 8. Soldering



IPC/JEDEC J-STD-020C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
<b>Average ramp-up rate (Tsmax to Tp)</b>	3° C/second max.	3° C/second max.
<b>Preheat</b> - Temperature Min (Tsmmin) - Temperature Max (Tsmmax) - Time (Tsmmin to Tsmmax) (ts)	100 °C 150 °C 60-120 seconds	150 °C 200 °C 60-180 seconds
Time maintained above: - Temperature (TL) - Time (tL)	183 °C 60-150 seconds	217 °C 60-150 seconds
Peak Temperature (Tp)	215°C	260°C
Time within 5°C of actual Peak Temperature (tp)2	10-30 seconds	20-40 seconds
Ramp-down Rate	6 °C/second max.	6 °C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

**\* Caution**

1. Reflow soldering should not be done more than one time.
2. Repairs should not be done after the LEDs have been soldered. When repair is unavoidable, suitable tools must be used.
3. Die slug is to be soldered.
4. When soldering, do not put stress on the LEDs during heating.
5. After soldering, do not warp the circuit board.
6. Recommend to use a convection type reflow machine with 7 ~ 8 zones.



## 9. Precaution for use

- Storage

To avoid the moisture penetration, we recommend storing Z Power LEDs in a dry box (or desiccator) with a desiccant. The recommended storage conditions are Temperature 5 to 30 degrees Centigrade. Humidity 50% maximum.

- Precaution after opening packaging

However LED is correspond SMD, when LED be soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop.

Attention in followed.

- a. Soldering should be done right after opening the package (within 24Hrs).
  - b. Keeping of a fraction
    - Sealing
    - Temperature : 5 ~ 40℃ Humidity : less than 30%
  - c. If the package has been opened more than 1week or the color of desiccant changes, components should be dried for 10-12hr at 60±5℃
- Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temp. after soldering.
  - Please avoid rapid cooling after soldering.
  - Components should not be mounted on warped direction of PCB.
  - Anti radioactive ray design is not considered for the products listed here in.
  - Gallium arsenide is used in some of the products listed in this publication. These products are dangerous if they are burned or shredded in the process of disposal. It is also dangerous to drink the liquid or inhale the gas generated by such products when chemically disposed.
  - This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When washing is required, IPA(Isopropyl Alcohol) should be used.
  - When the LEDs are illuminating, operating current should be decided after considering the package maximum temperature.
  - LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from SSC, a sealed container with a nitrogen atmosphere should be used for storage.
  - The appearance and specifications of the product may be modified for improvement without notice.
  - Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
  - The slug is connected to the anode. Therefore, we recommend to isolate the heat sink.
  - Attaching LEDs, don't use adhesives to generate organic vapor.

## Handling of Silicone resin LEDs

Z-Power LED is encapsulated by silicone resin for the highest flux efficiency.

Notes for handling of Silicone resin Z-Power LEDs

- Avoid touching silicone resin parts especially by sharp tools such as Pincette(Tweezers)
- Avoid leaving fingerprints on silicone resin parts.
- Dust sensitivity silicone resin need containers having cover for storage.
- When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevent.
- Please do not force over 2000 gf impact or pressure diagonally on the silicon lens.  
It will cause fatal damage of this product
- Please do not recommend to cover the silicone resin of the LEDs with other resin  
(epoxy, urethane, etc)
- Please do not mold this product into another resin (epoxy, urethane, etc) and do not handle this product with acid or sulfur material in sealed space.