

	P7 Cool white (W724C0)	P7-II Warm white (SPW87A0A)
Circuit diagram		
Max IF	2800mA (700mA per chip)	1400mA (700mA per chip)
Typ IF	1400mA (350mA per chip)	700mA (350mA per chip)
V <sub>F</sub>	3~4V	6~8V
CRI	70	77
Luminous Flux	Typ 750lm (@2800mA)	Typ 330lm (@700mA)

# SPW87A0A

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

## SPW87A0A

### Features

- Super high Flux output and high Luminance
- Designed for high current operation
- Low thermal resistance
- SMT solderable
- Lead Free product
- RoHS compliant

### Application

- Automotive interior / exterior lighting
- Automotive signal lighting
- Automotive forward lighting
- General Torch
- Architectural lighting
- Projector light source
- Traffic signals
- Task lighting
- Decorative / Pathway lighting
- Remote / Solar powered lighting
- Household appliances

## Full Code of Z-Power LED Series

Full code form : X<sub>1</sub> X<sub>2</sub> X<sub>3</sub> X<sub>4</sub> X<sub>5</sub> X<sub>6</sub> X<sub>7</sub> X<sub>8</sub>

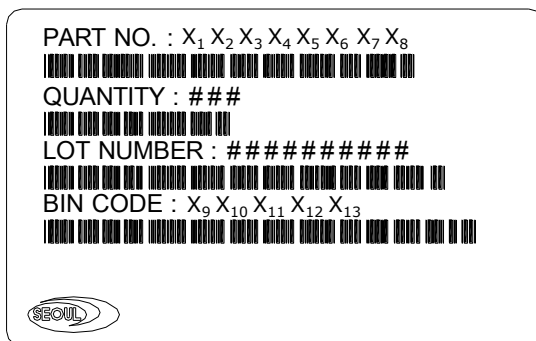
### 1. Part Number

- X<sub>1</sub> : Seoul Semiconductor
- X<sub>2</sub> : PKG type
- X<sub>3</sub> : Color
- X<sub>4</sub> : CRI
- X<sub>5</sub> : Z-Power LED series number
- X<sub>6</sub> : Type of Lens
- X<sub>7</sub> : Type of PCB
- X<sub>8</sub> : Revision

### 2. Code Labeling

- X<sub>9</sub> : Luminous flux (or Radiant flux for royal blue)
- X<sub>10</sub> X<sub>11</sub> X<sub>12</sub> : Dominant wavelength  
(or x,y coordinates rank code)
- X<sub>13</sub> : Forward voltage

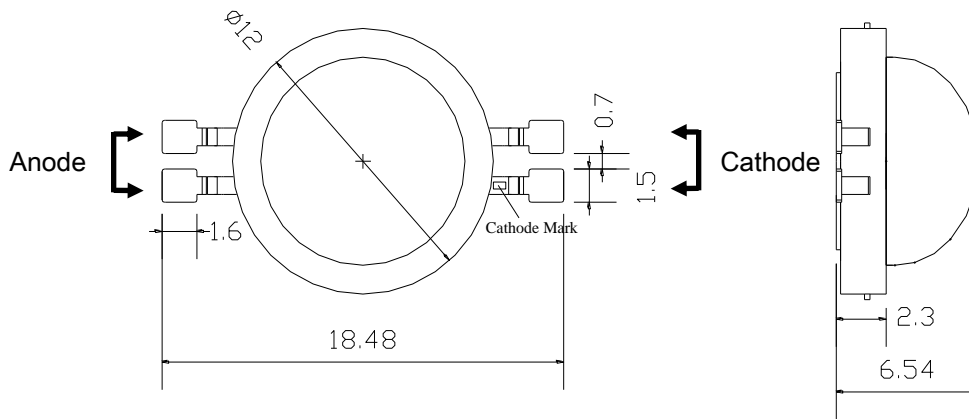
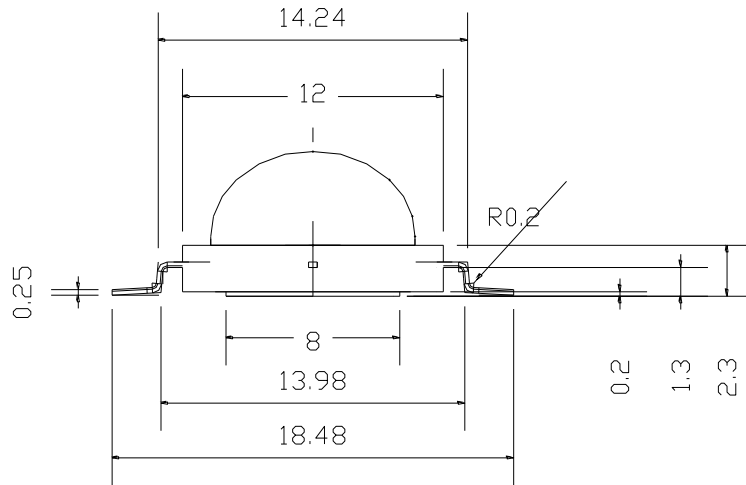
### 3. Sticker Diagram on Reel & Aluminum Vinyl Bag



For more information about binning and labeling, refer to the Application Note -1

## Outline Dimensions

### 1. Dome Type



Notes :

1. All dimensions are in millimeters. (tolerance :  $\pm 0.2$  )
2. Scale : none
3. Slug of package is connected to cathode.
4. The two leads are electrically connected

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

## Characteristics for Dome type Z-Power LED

### 1. Warm White

1-1 Electro-Optical characteristics at  $I_F=700\text{mA}$ ,  $T_A=25^\circ\text{C}$

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	$\Phi_V$ [2]		330		lm
	$\Phi_V$ [2] $I_F=1400\text{mA}$	-	570	-	lm
Correlated Color Temperature [3]	CCT	3700	3000	2600	K
CRI	$R_a$	-	77		-
Forward Voltage [4]	$V_F$	-	7	8	V
	$V_F$ $I_F=1400\text{mA}$	-	7.8	-	V
View Angle	$2\theta$ 1/2	120			deg.
Thermal resistance [5]	$R\theta$	3			$^\circ\text{C}/\text{W}$

1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	$I_F$	1400	mA
Power Dissipation	$P_d$	11.2	W
Junction Temperature	$T_j$	140	$^\circ\text{C}$
Operating Temperature	$T_{opr}$	-40 ~ +85	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +100	$^\circ\text{C}$
ESD Sensitivity [6]	-	$\pm 20,000\text{V}$ HBM	-

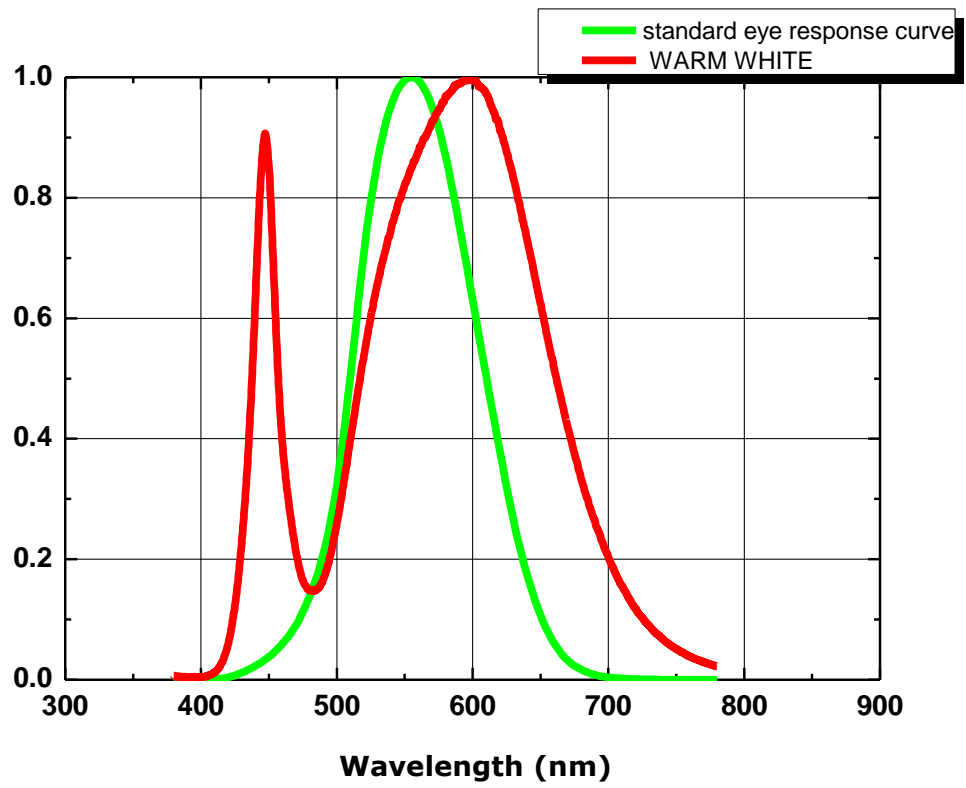
\*Notes :

- [1] SSC maintains a tolerance of  $\pm 10\%$  on flux and power measurements.
- [2]  $\Phi_V$  is the total luminous flux output as measured with an integrated sphere.
- [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram. CCT  $\pm 5\%$  tester tolerance.
- [4] A tolerance of  $\pm 0.06\text{V}$  on forward voltage measurements
- [5]  $R\theta$  is measured with only emitter. ( $25^\circ\text{C} \leq T_j \leq 110^\circ\text{C}$ )
- [6] It is included the zener chip to protect the product from ESD.

-----Caution-----

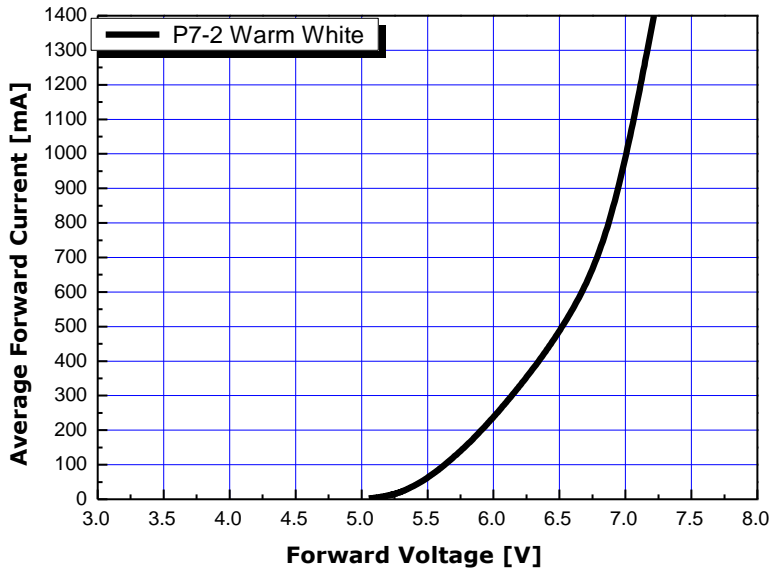
**1. Please do not drive at rated current more than 5 sec. without proper heat sink.**

Color spectrum, TA=25°C

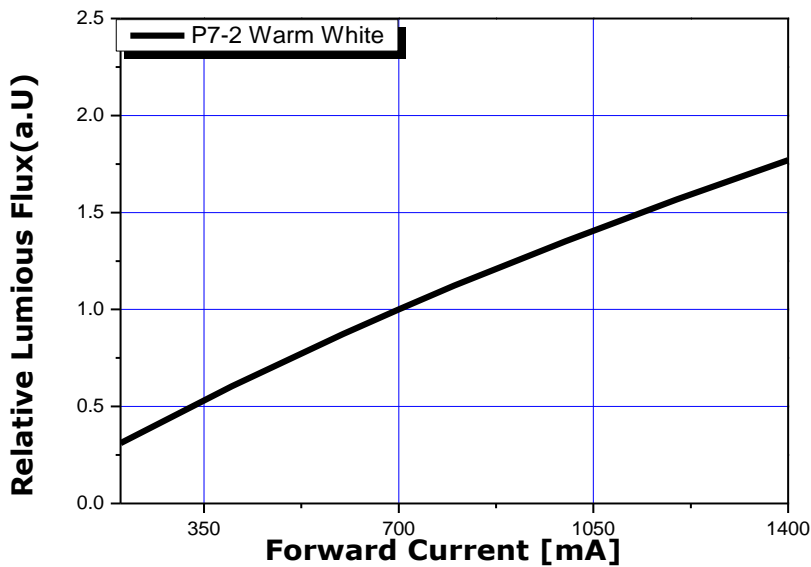


## Forward Current Characteristics

### 1. Forward Voltage vs. Forward Current, $T_A=25^\circ\text{C}$

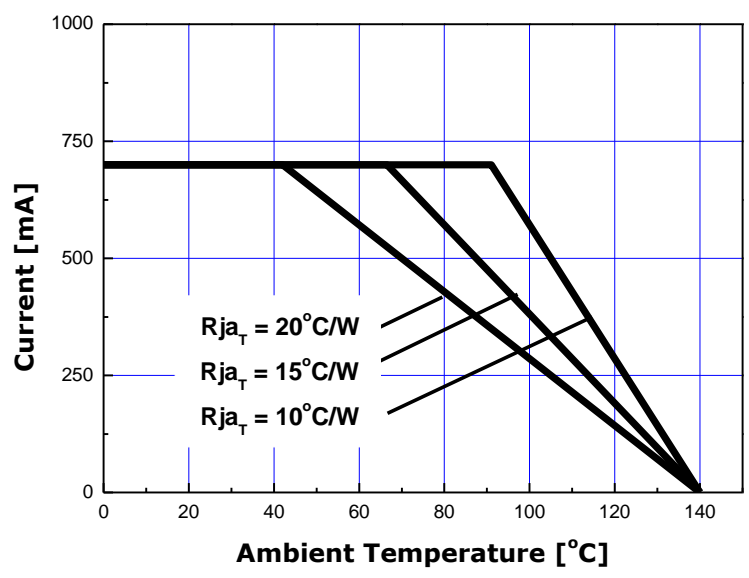


### 2. Forward Current vs. Normalized Relative Luminous Flux, $T_A=25^\circ\text{C}$

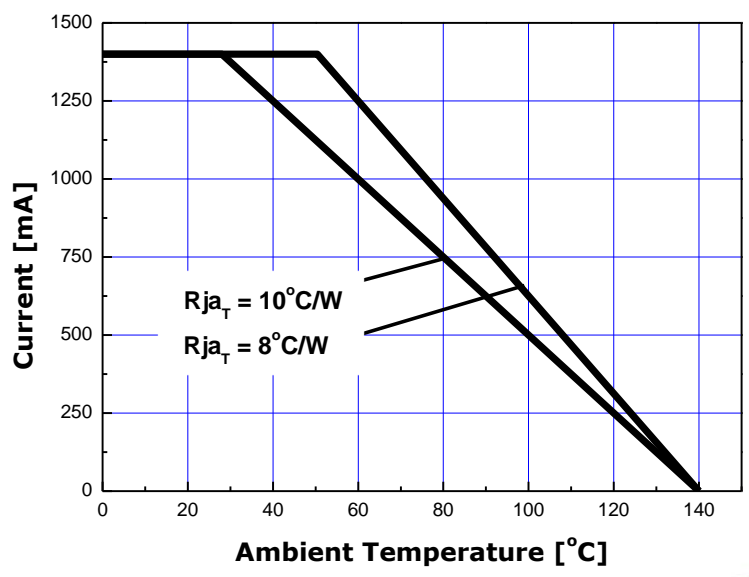


## Ambient Temperature vs Allowable Forward Current

### 1-1. Warm White ( $T_{JMAX} = 140\text{ }^{\circ}\text{C}$ , @700mA)



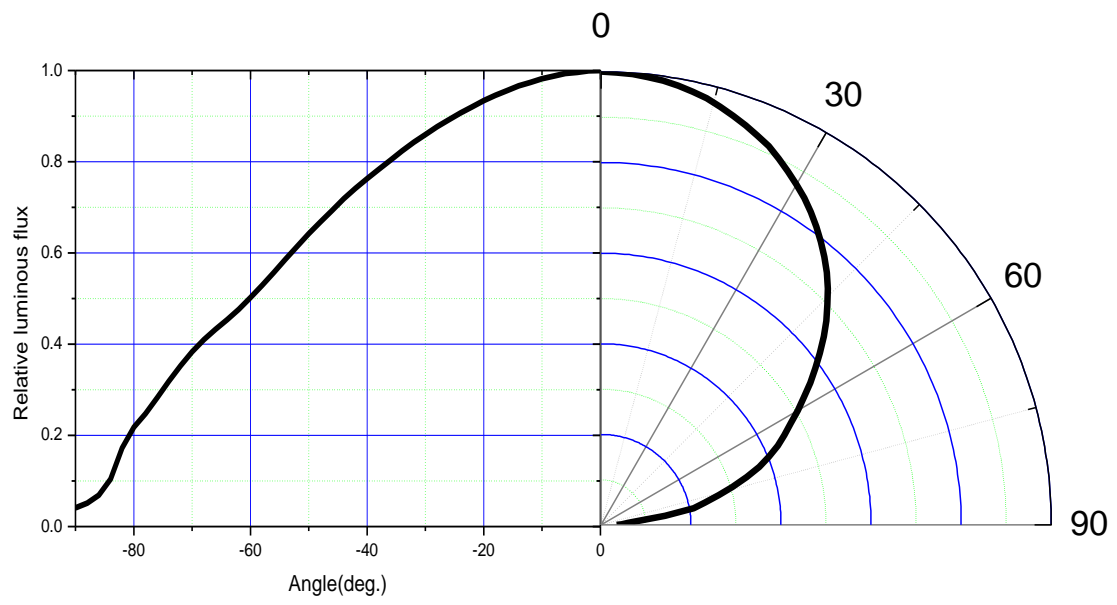
### 1-2. Warm White ( $T_{JMAX} = 140\text{ }^{\circ}\text{C}$ , @1400mA)





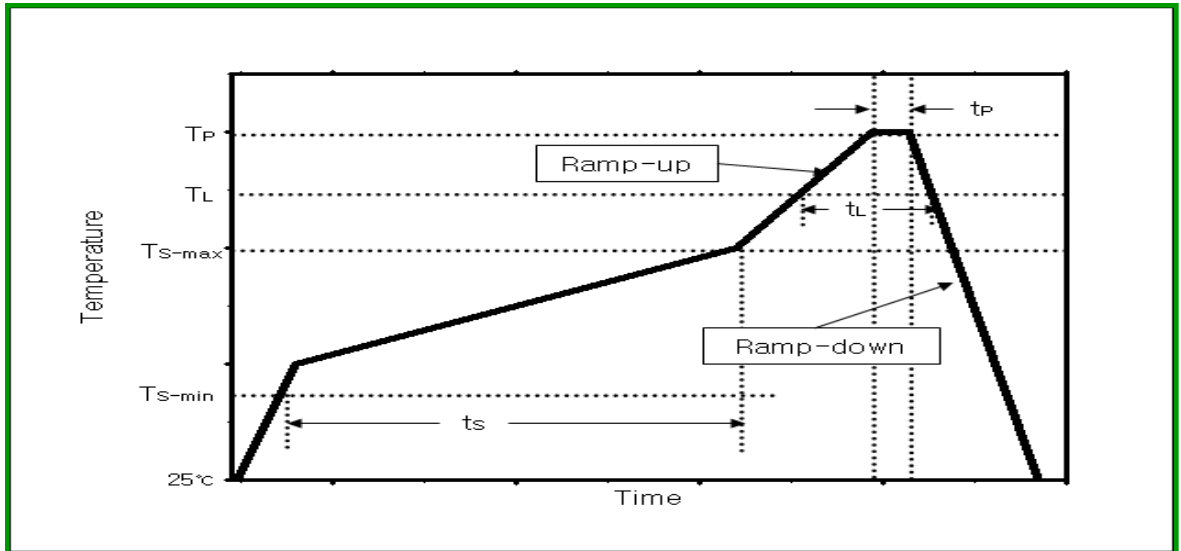
## Typical Dome Type Radiation pattern

### 1. Warm White



## Solder profile

### 1. Reflow solder conditions / profile



Reflow condition	Pb-Free assembly
Average ramp-up rate (TS-max to Peak)	2~3°C / second
Preheat Temperature Min (TS-min)	150°C
Preheat Temperature Max (TS-max)	200°C
Time maintained above: : Liquidus Temperature (TL)	217~220°C
Time maintained above: Time (tL)	60~150 seconds
Peak Temperature (TP)	250°C
Time within 5°C of actual Peak Temperature (tp)	20~40 seconds
ramp-down rate	4~6°C / second
Time 25°C to Peak Temperature	6 minutes max

### 2. Hand Solder conditions

2-1 Lead : Not more than 3 seconds @MAX280°C

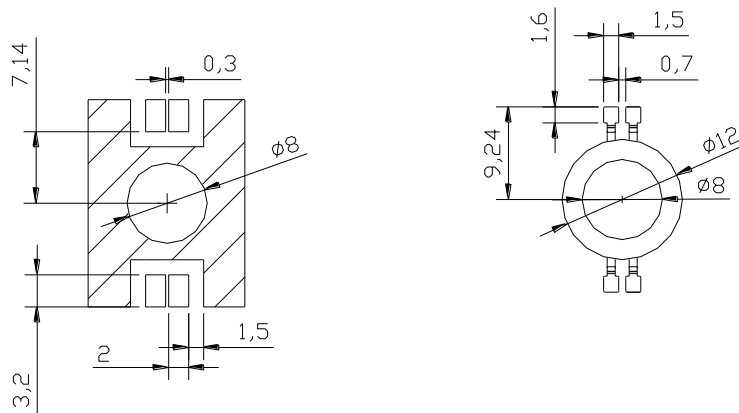
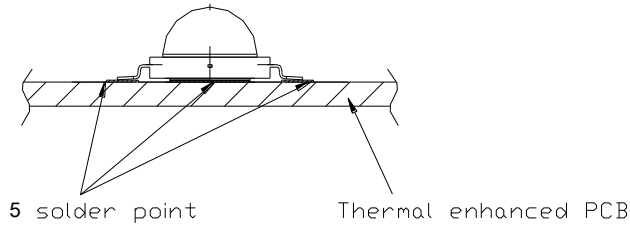
2-2 Slug : Use a thermal adhesive

#### \* Caution

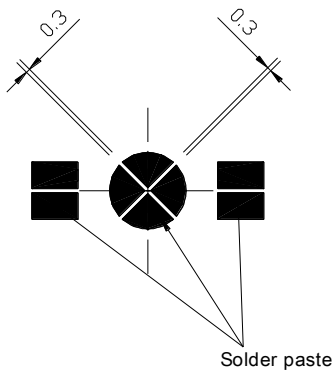
- [1] Reflow soldering should not be done more than one time.
- [2] Repairs should not be done after the LED has been soldered to the board. If repairs are unavoidable, suitable tools must be used.
- [3] Die slug is to be soldered.
- [4] During the soldering process, do not put stress on the LED.
- [5] After soldering, do not warp or twist circuit board.
- [6] Recommend to use a convection type reflow machine with 7 ~ 8 zones. Rev. 00

## Recommended Soldering

### 1. Solder pad



### 2. Solder paste pattern



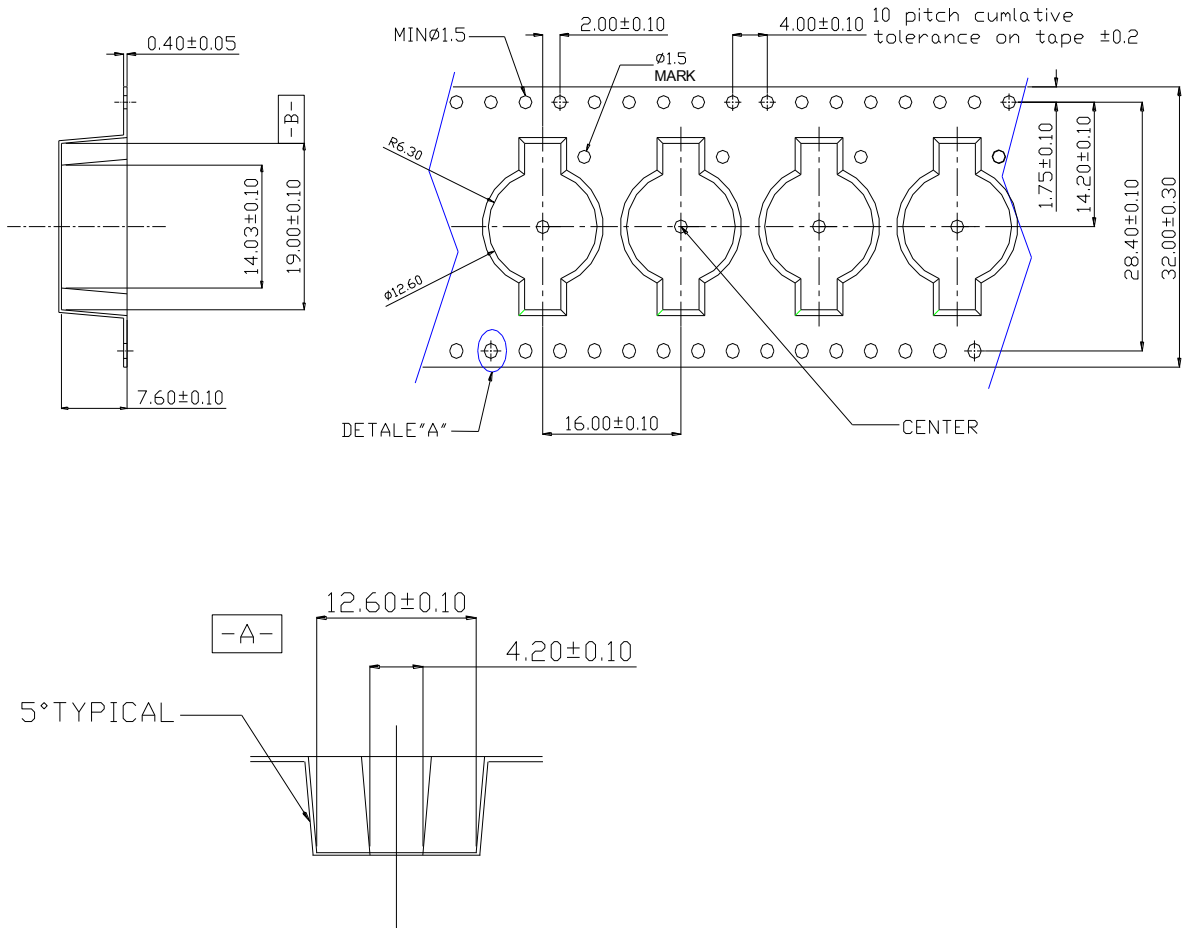
Paste thickness : 0.2mm

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.

## Emitter Reel Packaging



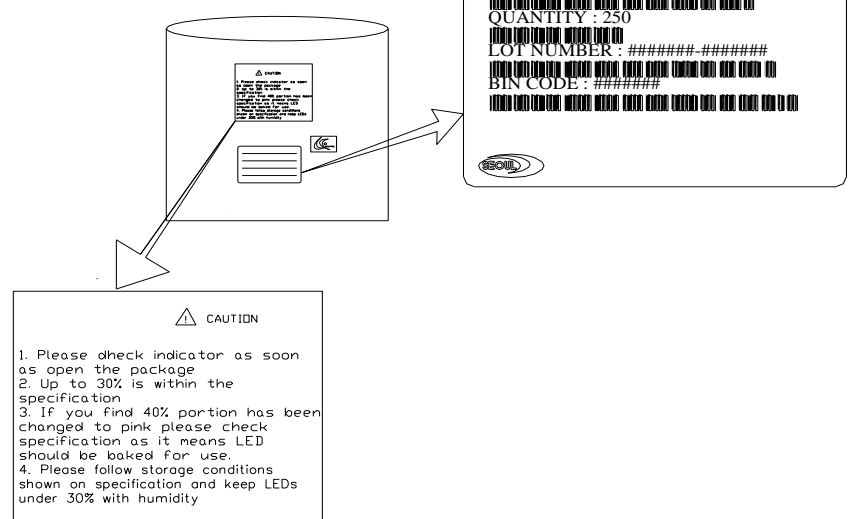
Note :

1. The number of loaded products in the reel is 250ea
2. All dimensions are in millimeters
3. Scale none

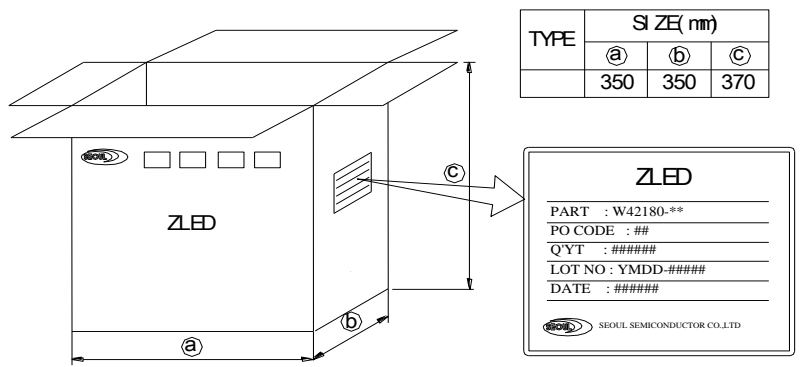
\*The appearance and specifications of the product may be changed for improvement without notice.

## Packaging Structure

### Aluminum Viny Bag



### Outer Box



**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

## 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°C 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°C
- 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.

## 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 3000 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)