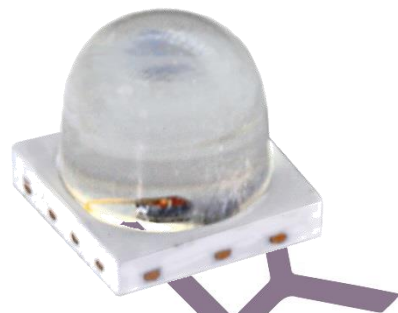


# 5ZSC30DV14JV01ZM

- ◆ Outline : 3.0\*3.0\*3.0mm
- ◆ High efficiency
- ◆ Good thermal dissipation & optical uniform



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## Features

- RoHS2.0 and REACH-compliant
- MSL2 qualified according to J-STD 020
- ESD 2KV (HBM : MIL-STD-883 Class 2)

## Applications

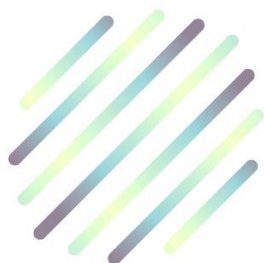
- Automobile lighting
- Decorative lighting

**■ Product Code**
**5 – Z – SC30 – D – V14J – V – 0 – 1 – Z – M**

①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩

①	②	③	④	⑤
Process type	Category	Specification	Lens Angle code	Dice wavelength & Luminous rank
5: For Automotive	Z: High Power LED	SC30: 3030	D: 30°	VXXX: Red light & level

⑥	⑦	⑧	⑨	⑩
Support code	Zener	Cap color code	Module & Lens code	Current code
V: Substrate Code	0: None Zener	1: Series No.	Z: Molding	M : 70mA

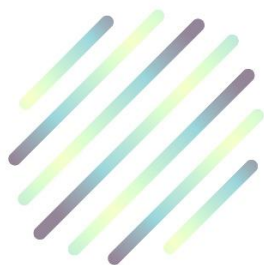


**■ Typical Product Characteristics(Ta=25°C)**

Luminous Flux (lm) @70mA			Luminous Intensity (mcd) @70mA		Wavelength (nm)	Forward Voltage (V) @70mA		Viewing Angle
Group	Min.	Max.	Min.	Max.		Min.	Max.	
B11	10	12	18000	22000	612-620	2.0	2.6	30°
B12	12	14	22000	25000				
B13	14	16	25000	28000				
B14	16	18	28000	31000				

Notes:

1. Forward voltage ( $V_F$ )  $\pm 0.1V$  ; Radiant power ( $P_O$ )  $\pm 7\%$  ; Wavelength ( $\lambda_d$ )  $\pm 1nm$  ; Viewing angle( $2\theta_{1/2}$ )  $\pm 10^\circ$
2. IS standard testing.
3. Note: the brightness data is only for reference

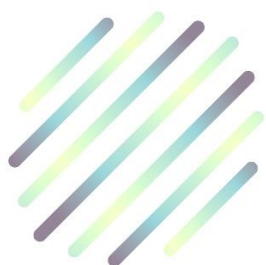


**■ Maximum Rating (Ta : 25°C)**

Characteristics	Symbol	Min.	Typical	Max.	Unit
DC Forward Current <sup>1</sup>	$I_F$			100	mA
Reverse Voltage	$V_R$			5	V
Reverse Current	$I_R$			10	$\mu A$
Junction Temperature <sup>2</sup>	$T_j$			125	°C
Thermal Resistance Junction / Solder Point	$R_{j-s}$		28		°C/W
Storage Temperature Range	$T_{stg}$	-40	—	100	°C
Soldering Temperature	$T_{sol}$			260	°C

**Notes:**

1. For other ambient, limited setting of current will depend on de-rating curves.
2. When drive on maximum current ,  $T_j$  must be kept below 125°C



## ■ Dominant Wavelength Binning

Bin code (70mA)	Min. $\lambda_d$ (nm)	Max. $\lambda_d$ (nm)
R612A	612	616
R616A	616	620

## ■ Intensity Binning

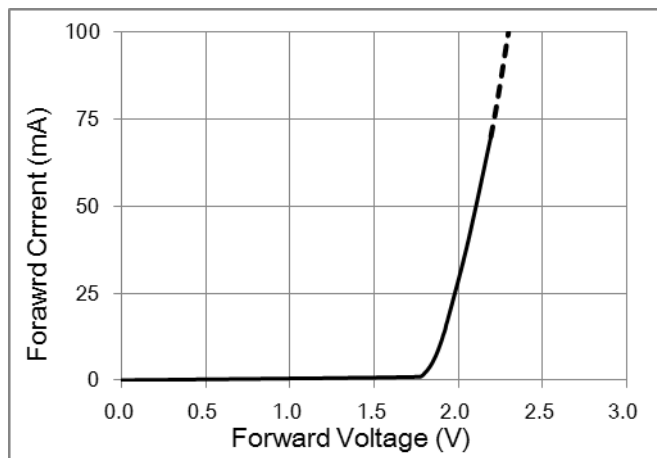
Bin code (70mA)	Min. $\Phi_v$ (lm)	Max. $\Phi_v$ (lm)
B11	10	12
B12	12	14
B13	14	16
B14	16	18

## ■ Forward Voltage Binning

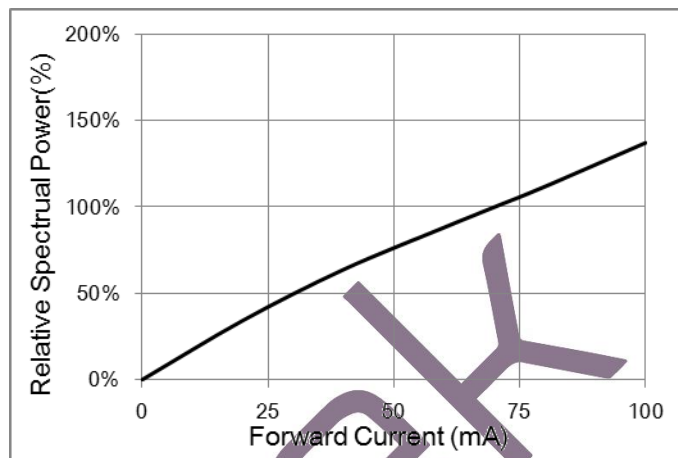
Bin code (70mA)	Min. $V_F$ (V)	Max. $V_F$ (V)
V2022	2.0	2.2
V2224	2.2	2.4
V2426	2.4	2.6

## ■ Electronic-Optical Characteristics

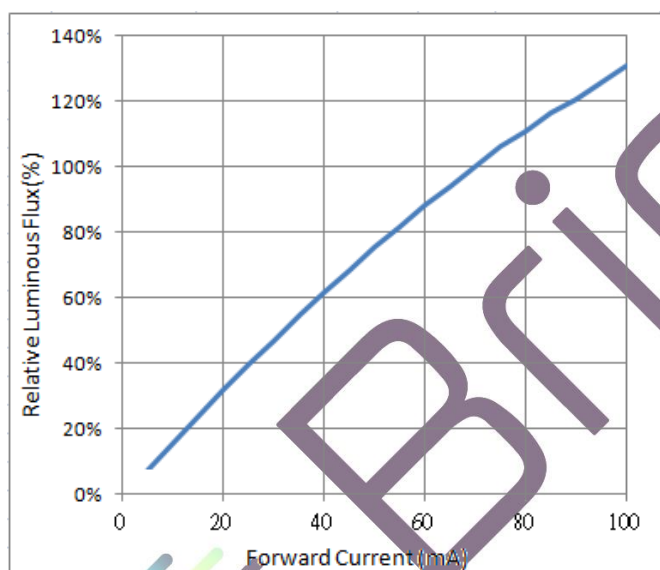
Forward Current vs. Forward Voltage ( $T_a=25^\circ\text{C}$ )



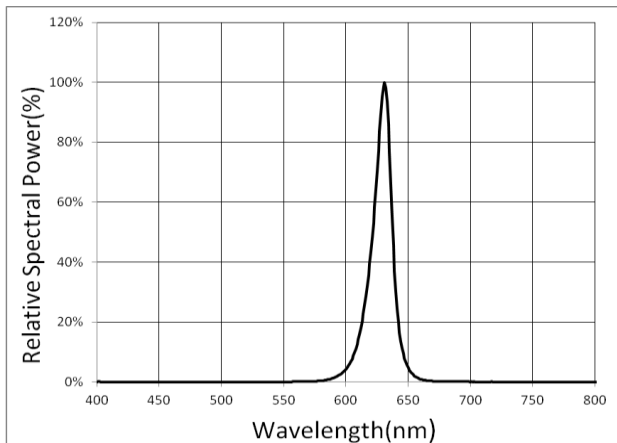
Relative luminous Flux vs. Forward Current ( $T_a=25^\circ\text{C}$ )



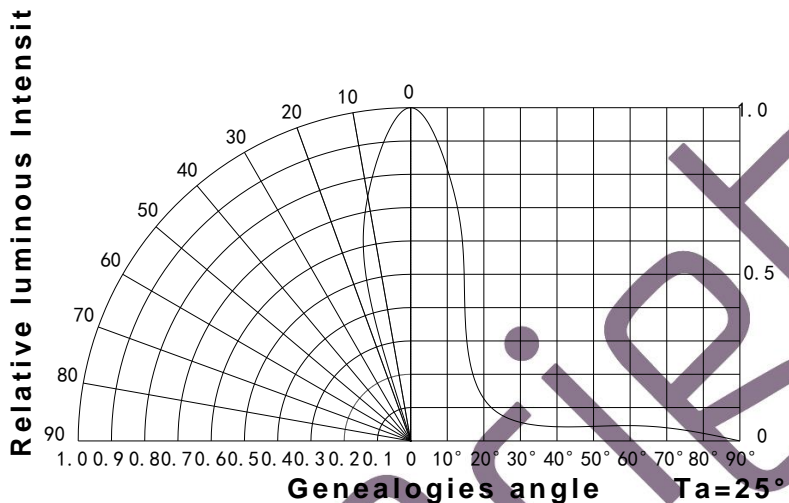
Forward Current vs. Relative Luminous Flux ( $T_a=25^\circ\text{C}$ )



## ■ Relative spectral power distribution

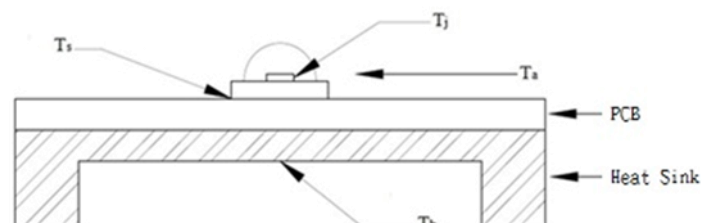
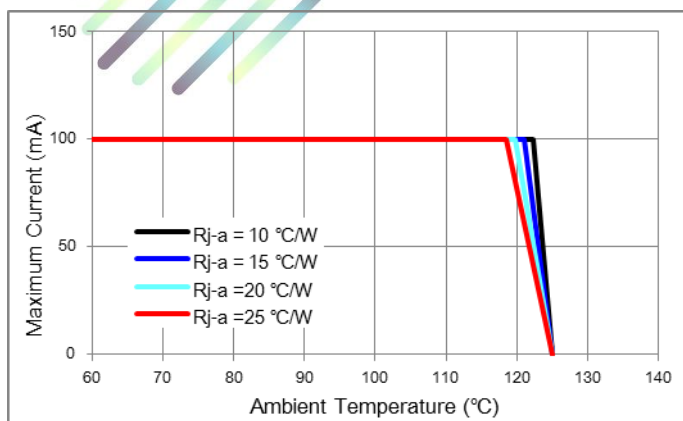


## ■ Typical Spatial Distribution



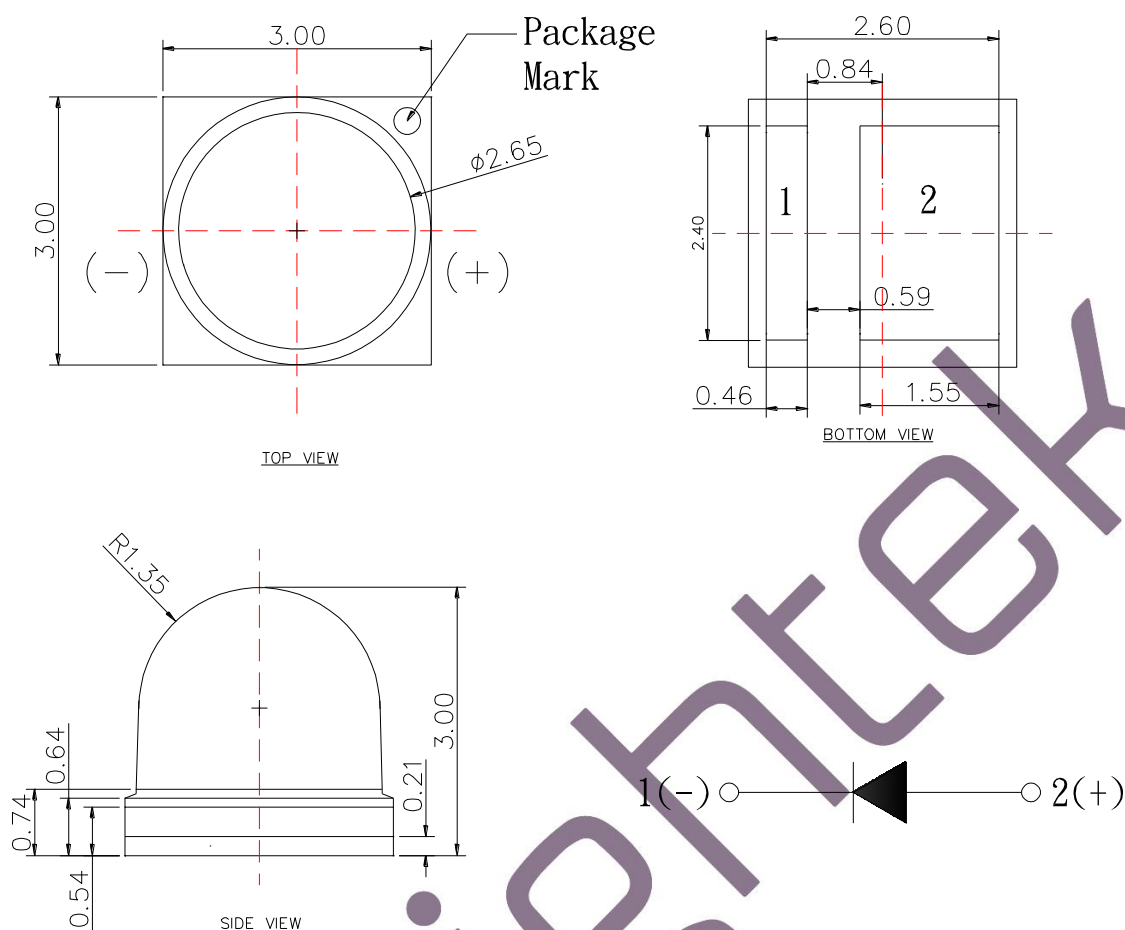
## ■ Thermal Design for De-rating

The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.



$T_j$  : LED junction Temp.  
 $T_s$  : Solder Point Temp.  
 $T_h$  : Heat Sink Temp.  
 $T_a$  : Ambient Temp.  
 $R_{j-a}$  : Thermal Resistance from  $T_j$  to  $T_a$

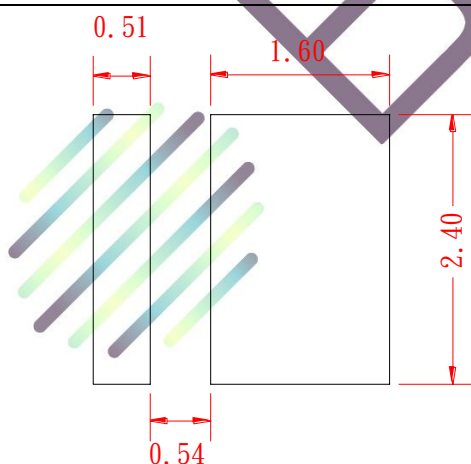
## ■ Dimensions



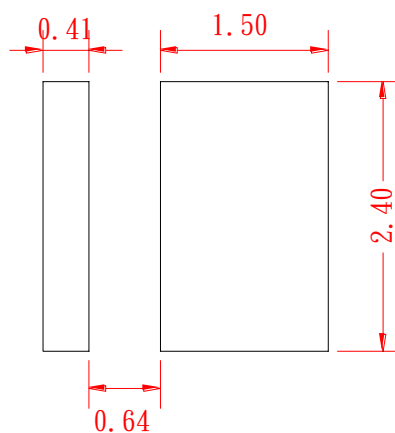
§ All dimensions are in millimeters.

§ Tolerance is  $\pm 0.13\text{mm}$  unless other specified.

## ■ Suggest Stencil Pattern (Recommendations for reference)



**RECOMMENDED PCB SOLDER PAD**

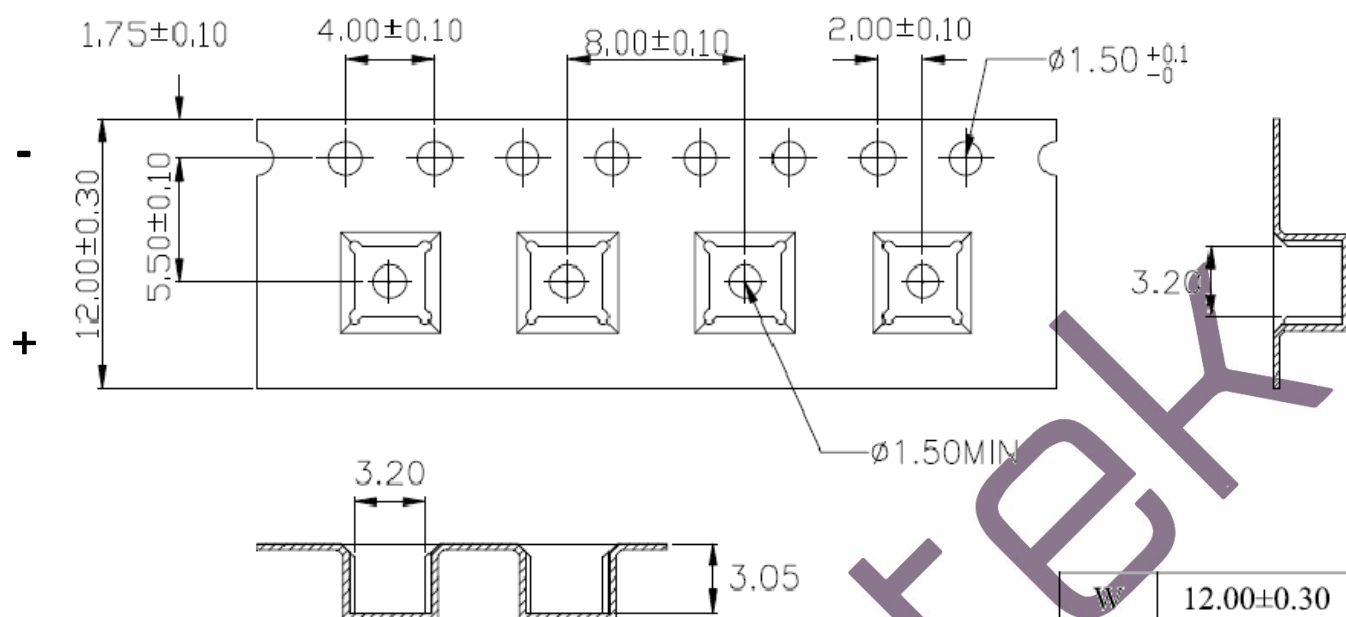


**RECOMMENDED STENCIL PATTERN**  
(HATCHED AREA IS OPENING)

§ Suggest stencil  $t = 0.12\text{ mm}$

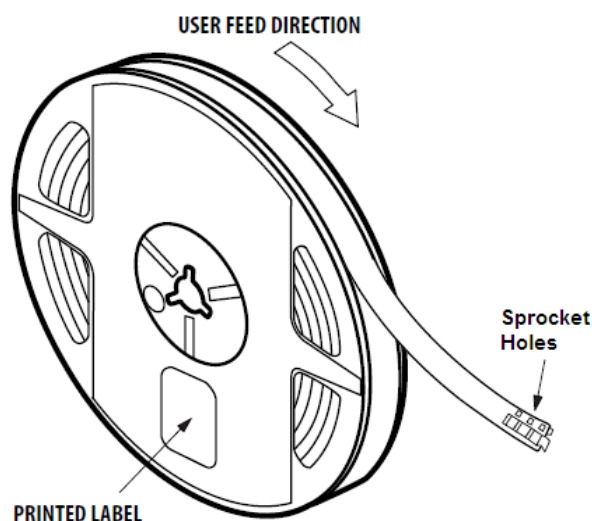
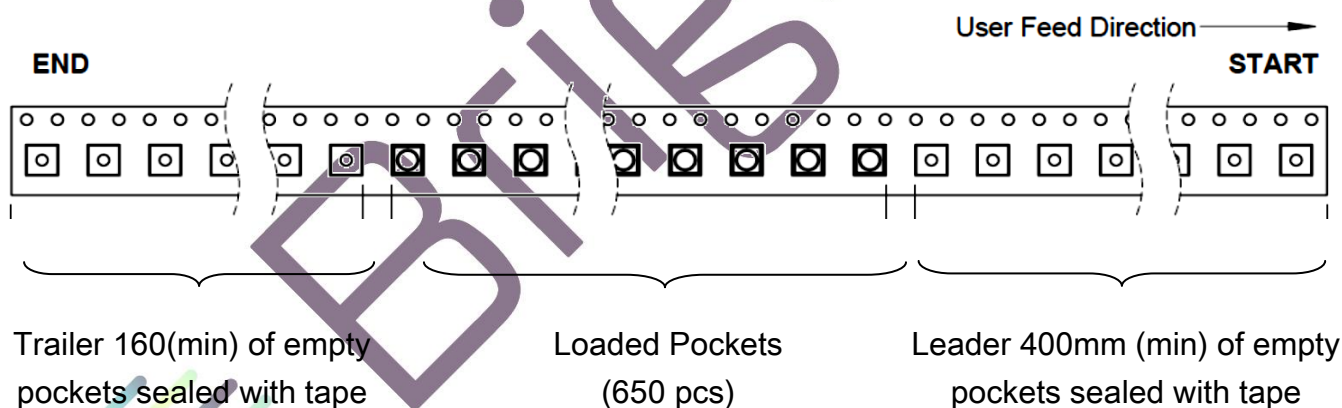


# **Packing**

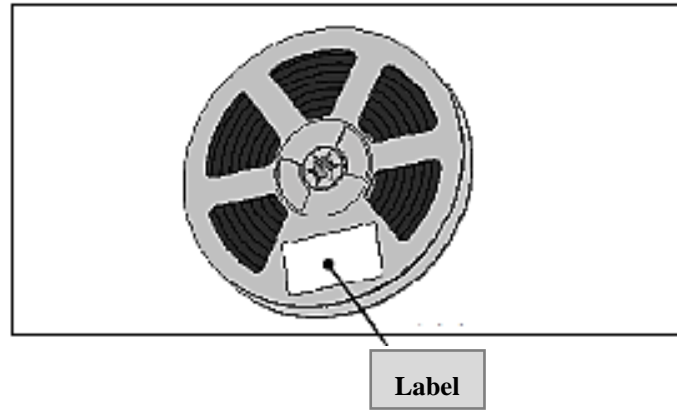


1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.20$ .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness :  $0.30 \pm 0.05$ mm.

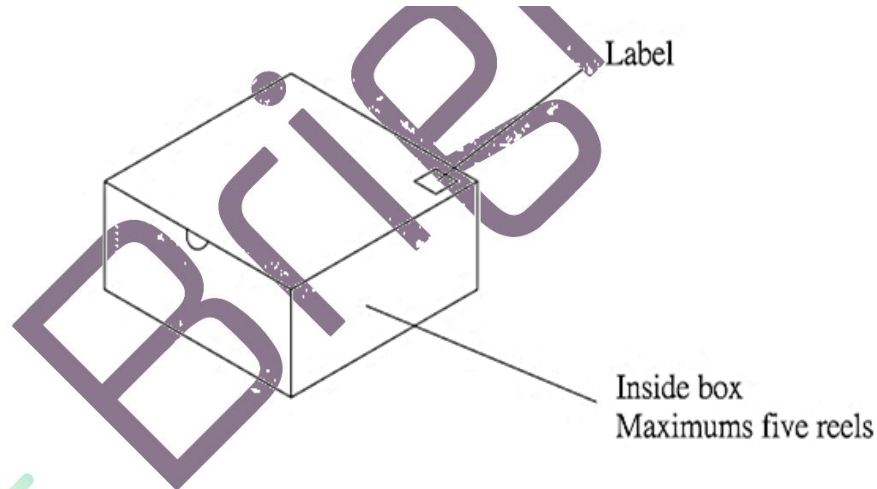
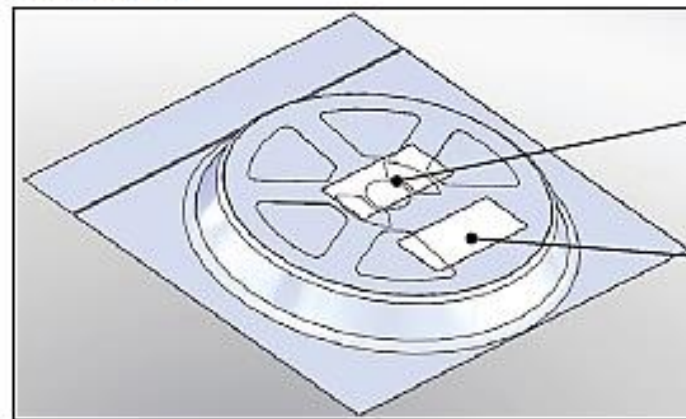
W	12.00±0.30
A0	3.20±0.10
B0	3.20±0.10
K0	3.05±0.10



Unpackaged Reel



Packaged Reel

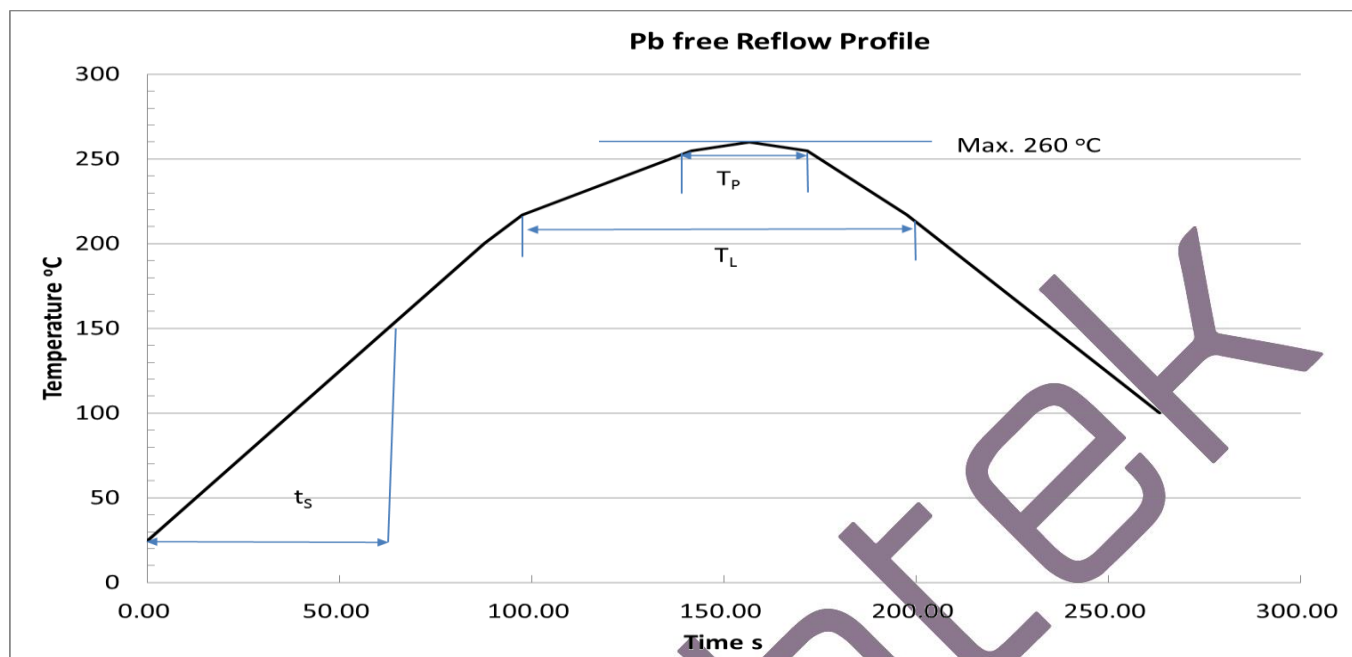


#### Notes:

1. Each reel (minimum number of pieces is 500 and maximum is 650 for 30 degree product) is packed in a moisture-proof bag along with a packs of desiccant and a humidity indicator card.
2. A maximum of 5 moisture-proof bags are packed in an inner box (size: 260mm x 230mm x 100mm  $\pm$ 5mm).
3. A maximum of 4 inner boxes are put in an outer box (size: 480mm x 275mm x 215mm  $\pm$ 5mm).
4. Part No., Lot No., quantity should be indicated on the label of the moisture-proof bag and the cardboard box.

## ■ Reflow Profile

### IR Reflow Soldering Profile



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up Rate to Preheat (25°C to 150°C)			2	3	K/s
Time $t_s$ ( $T_{Smin}$ to $T_{Smax}$ )	$t_s$	60	100	120	s
Ramp-up Rate to Peak ( $T_{Smax}$ to $T_P$ )			2	3	K/s
Liquidus Temperature	$T_L$	217			°C
Time above Liquidus temperature	$t_L$		80	100	s
Peak Temperature	$T_P$		245	260	°C
Time within 5 °C of the specified peaktemperature $T_P - 5$ K	$t_p$	10	20	30	s
Ramp-down Rate ( $T_P$ to 100 °C)			3	4	K/s
Time 25 °C to $T_P$				480	s

#### Notes:

1. Do not stress the silicone resin while it is exposed to high temperature.
2. The reflow process should not exceed 2 times.

### ■ Precautions

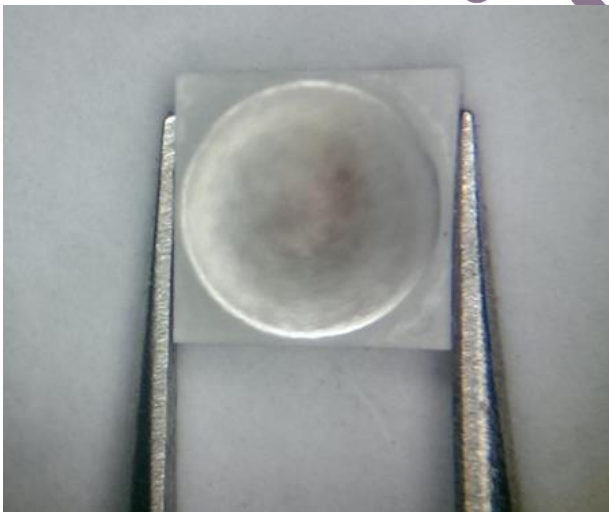
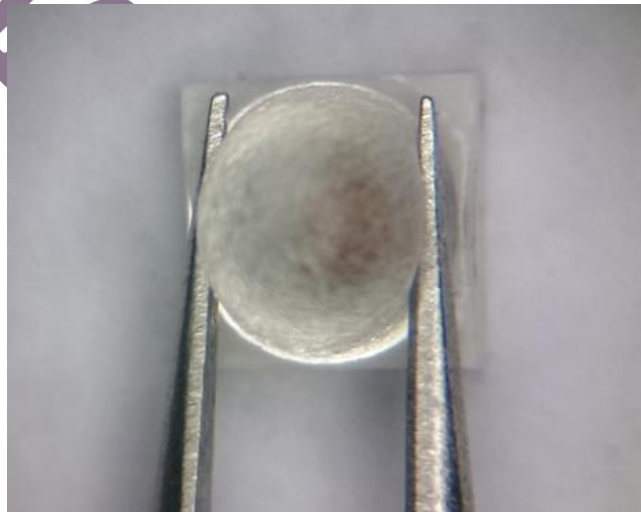
#### 1. Recommendation for using LEDs

- 1.1 The lens of LEDs should not be exposed to dust or debris. Excessive dust and debris may cause a drastic decrease in the luminosity.
- 1.2 Avoid mechanical stress on LED lens.
- 1.3 Do not touch the LED lens surface. It would affect the optical performance of the LED due to the LED lens' damage.
- 1.4 Pick & place tools are recommended for the remove of LEDs from the factory tape & reel packaging

#### 2. Lens handling

Please follow the guideline to pick LEDs.

- 2.1 Use tweezers to pick LEDs.
- 2.2 Do not touch the lens by using tweezers.
- 2.3 Do not touch lens with fingers.
- 2.4 Do not apply more than 4N (400gw) directly onto the lens.

Correct ( √ )	Wrong ( X )
	

#### 3. Lens cleaning

In the case which a small amount of dirt and dust particles remain on the lens surface, a suitable cleaning solution can be applied.

- 3.1 Try a gentle wiping with dust-free cloth.
- 3.2 If needed, use dust-free cloth and isopropyl alcohol to gently clean the dirt from the lens surface.

3.3 Do not use other solvents as they may directly react with the LED assembly.

3.4 Do not use ultrasonic cleaning which will damage the LEDs.

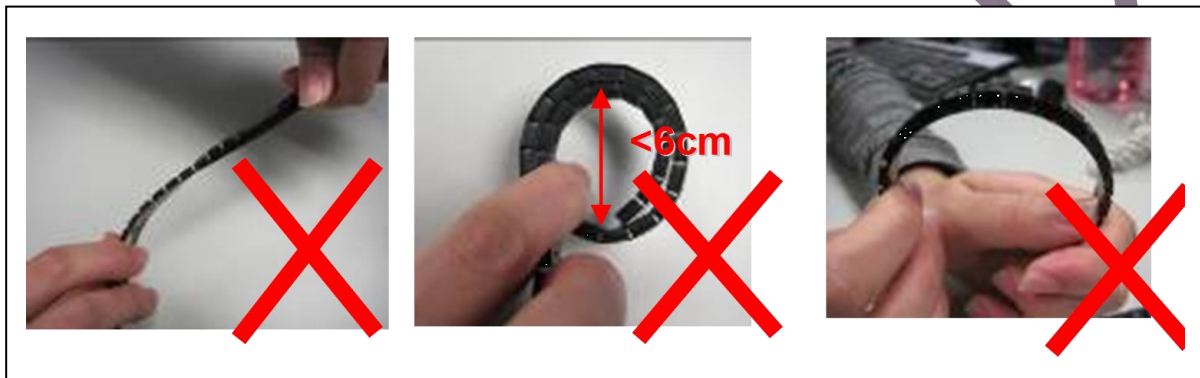
#### 4. Carrier tape handling

The following items are recommended when handling the carrier tape of LEDs.

4.1 Do not twist the carrier tape.

4.2 The inward bending diameter should not be smaller than 6cm for each carrier tape.

4.3 Do not bend the tape outward.



#### 5. Storage

5.1 The moisture-proof bag is sealed :

The LEDs should be stored at 30°C or less and 90%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

5.2 The moisture-proof bag is opened :

The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If the humidity indicator card shows the pink color in 10% even higher or exceed the storage limiting time since opened, that we recommended to baking LEDs at 60°C at least 24hrs. To seal the remainder LEDs return to the moisture-proof bag, it's recommended to be with workable desiccants.



## ■ Test Items and Results of Reliability

Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
Thermal Shock	-40°C 30min ↑ ↓ 5min 125°C 30min	1000 cycles	0/77	AEC-Q101
High Temperature Storage	T <sub>a</sub> =100°C	1000 hrs	0/22	EIAJ ED-4701 200 201
Humidity Heat Storage	T <sub>a</sub> =85°C RH=85%	1000 hrs	0/22	EIAJ ED-4701 100 103
Low Temperature Storage	T <sub>a</sub> =-40°C	1000 hrs	0/22	EIAJ ED-4701 200 202
Life Test	T <sub>a</sub> =25°C I <sub>f</sub> =70mA	1000 hrs	0/22	
High Humidity Heat Operation	85°C RH=85% I <sub>f</sub> =70mA	1000 hrs	0/22	
High Temperature Operation	T <sub>a</sub> =85°C I <sub>f</sub> =70mA	1000 hrs	0/22	
ESD(HBM)	2KV at 1.5kΩ;100pf	3 Times	0/22	MIL-STD-883

Failure Criteria				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	V <sub>F</sub>	I <sub>f</sub> =70mA	-	USL <sup>1</sup> ×1.1
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V	-	100μA
Luminous Intensity	I <sub>v</sub>	I <sub>f</sub> =70mA	LSL <sup>2</sup> ×0.7	-

Notes:

1. USL: Upper specification level
2. LSL: Lower specification level