

3535HP LEDs

Color (Ag) Type



- ◆Outline : 3.5*3.5*2.0mm
3.5*3.5*2.9mm
- ◆High efficiency
- ◆Good thermal dissipation & optical uniformity

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Features

- RoHS and REACH-compliant
- MSL2 qualified according to J-STD 020
- ESD 8KV (HBM : MIL-STD-883 Class 3B)

Applications

- Portable lighting
- Outdoor lighting
- Indoor lighting
- Commercial lighting
- Industrial lighting
- Decorative lighting
- Automobile lighting

■ Product Code

5 – Z – HP35 – A – V27C – H – 0 – 3 – Z – 4

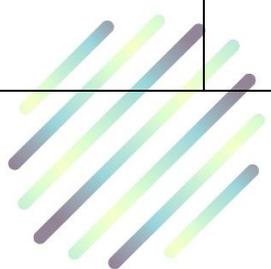
5 – Z – HP35 – B – V27C – H – 0 – 3 – Z – 4

5 – Z – HP35 – A – Y27C – H – 0 – 3 – Z – 4

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	②	③	④	⑤
Process type	Category	Specification	Lens code	Dice wavelength & Luminous rank
5: For Automotive	Z: SMD LED	HP35: Ceramic 3535	A: 120° B: 60°	VXXX: red light & level YXXX: Yellow light & level

⑥	⑦	⑧	⑨	⑩
Support code	Zener & High CRI	Cap color code	Module & Lens code	Current code
H: HTCC	0: None Zener	3: Series No.	Z: Molding	4: 350mA



■ Product list

Color	Luminous Flux (lm)			Wavelength (nm)	Forward Voltage (V) @350mA		Viewing Angle	Part Number
	Group	350mA Min.	700mA Max.		Min.	Max.		
Red	B23	40	67	620-630	1.8	2.4	120°	5ZHP35AV27CH03Z4
	B24	45	76					
	B25	50	85					
	B26	55	93					
	B27	60	102					
Red	B23	40	67	620-630	1.8	2.4	60°	5ZHP35BV27CH03Z4
	B24	45	76					
	B25	50	85					
	B26	55	93					
	B27	60	102					
Yellow	B25	50	85	585-595	1.8	2.4	120°	5ZHP35AY27CH03Z4
	B26	55	93					
	B27	60	102					
	B28	65	110					

Notes:

1. Forward voltage (V_F) $\pm 0.05V$; Luminous flux (Φ_v) $\pm 7\%$; Wavelength (λ_d) $\pm 1nm$; Viewing angle($2\theta_{1/2}$) $\pm 10^\circ$
2. IS standard testing.

■ Maximum Rating (Ta : 25°C)

Characteristics	Symbol	Min.	Typical	Max.	Unit
DC Forward Current ¹	I_F		350	700	mA
Pulse Forward Current ²	I_{PF}			1000	mA
Reverse Voltage	V_R			-5	V
Leakage Current (5V)	I_R			10	μA
Junction Temperature ³	T_j			150	°C
Thermal Resistance Junction / Solder Point	R_{th}		11		°C/W
Storage Temperature Range	T_{stg}	-40	-	100	°C
Soldering Temperature	T_{sol}			250	°C

Notes:

1. For other ambient, limited setting of current will depend on de-rating curves.
2. D=0.01s duty 1/10.
3. When drive on maximum current , T_j must be kept below 150°C



■ Dominant Wavelength Binning

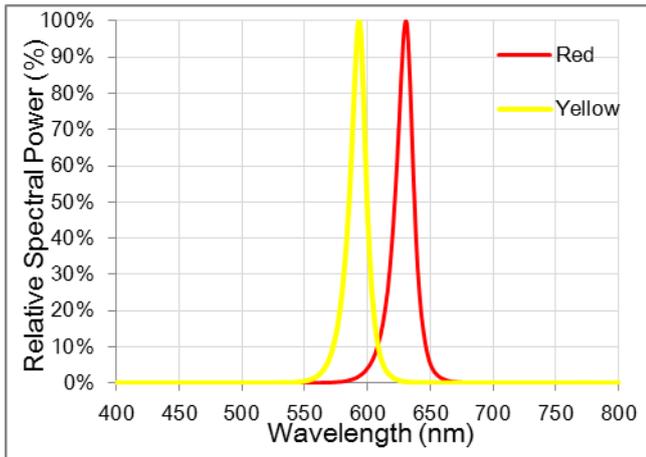
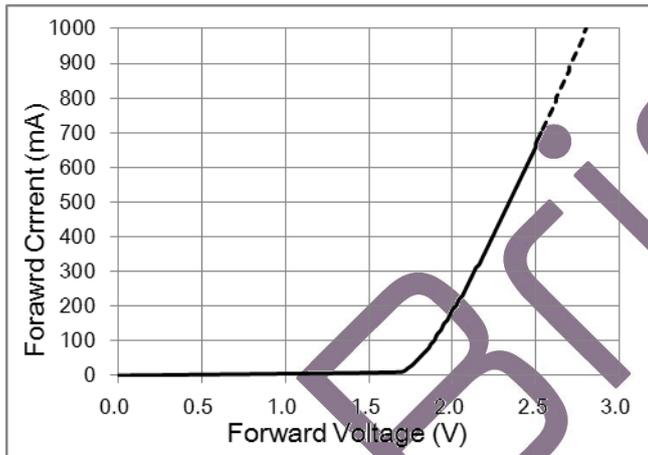
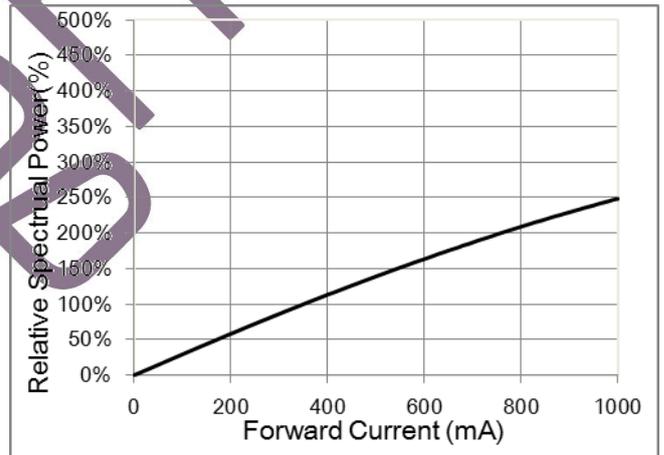
Bin code (350mA)	Min. λ_d (nm)	Max. λ_d (nm)
R620	620	625
R625	625	630
Y585	585	590
Y590	590	595

■ Intensity Binning

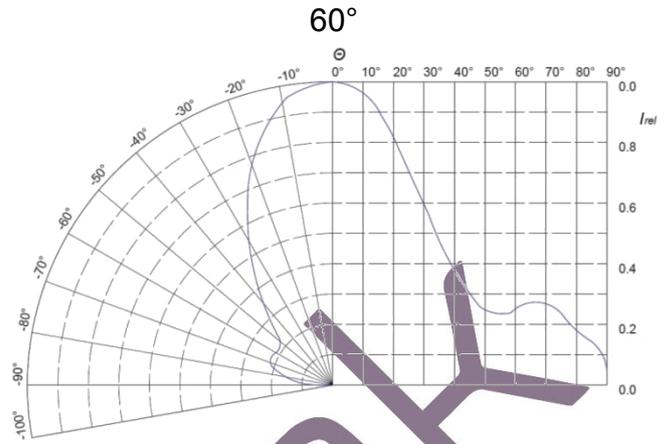
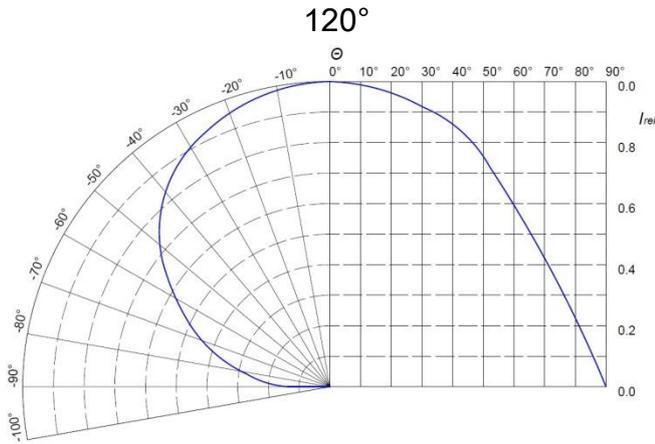
Bin code (350mA)	Min. Φ_v (lm)	Max. Φ_v (lm)
B23	40	45
B24	45	50
B25	50	55
B26	55	60
B27	60	65
B28	65	70

■ Forward Voltage Binning

Bin code (350mA)	Min. V_F (V)	Max. V_F (V)
V1820	1.8	2.0
V2022	2.0	2.2
V2224	2.2	2.4

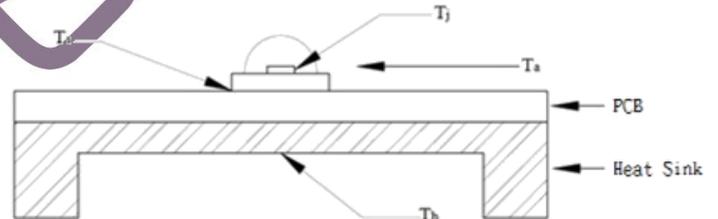
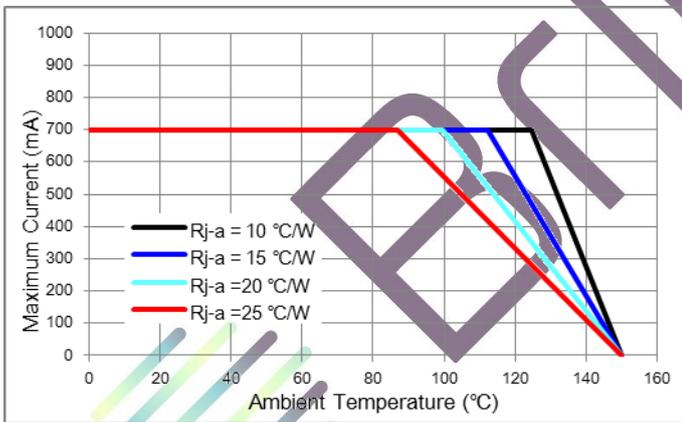
Relative spectral power distribution

Electronic-Optical Characteristics
Forward Current vs. Forward Voltage (Ta=25°C)

Relative luminous Flux vs. Forward Current (Ta=25°C)


■ Typical Spatial Distribution

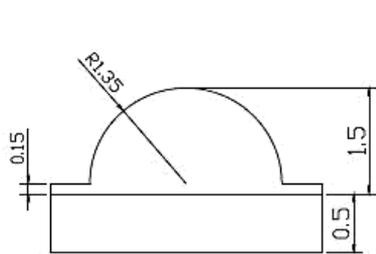
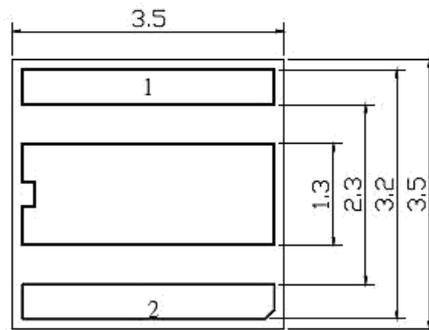
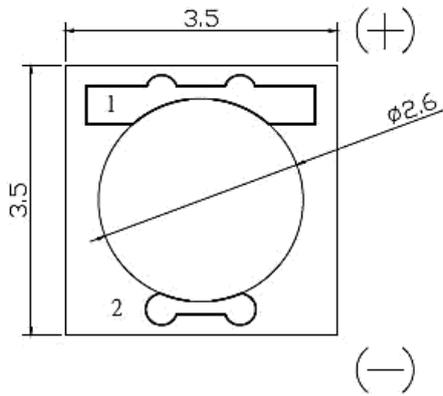
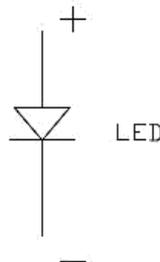
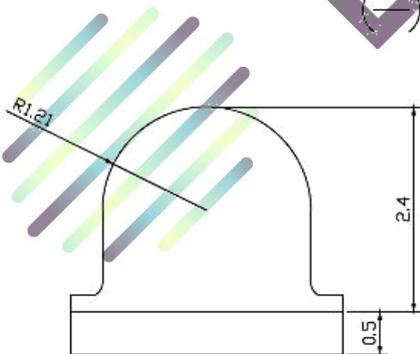
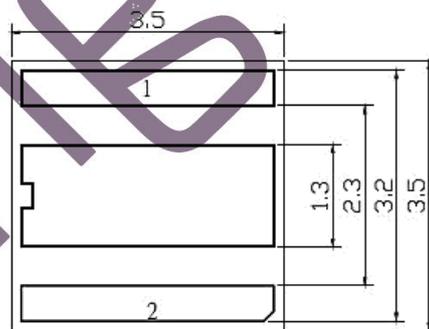
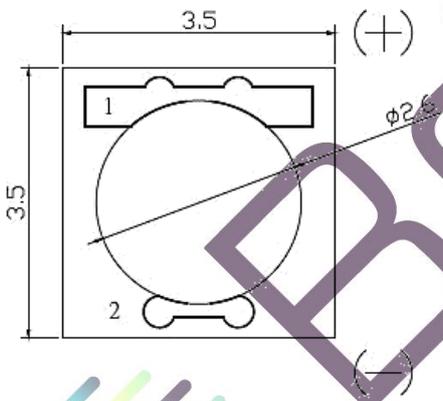


■ Thermal Design for De-rating

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.



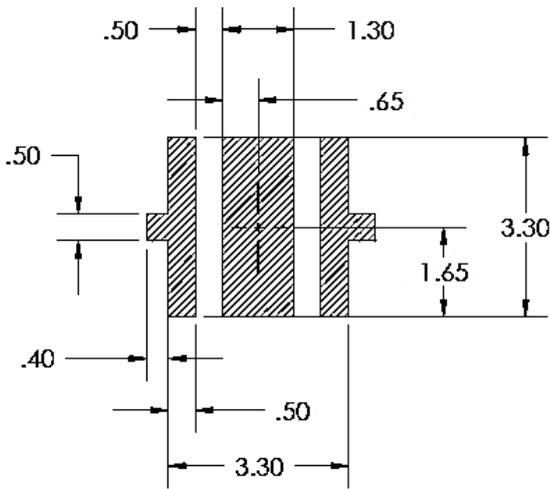
T_j : LED junction Temp.
 T_s : Solder Point Temp.
 T_h : Heat Sink Temp.
 T_a : Ambient Temp.
 R_{j-a} : Thermal Resistance from T_j to T_a

■ Dimensions
120°

60°


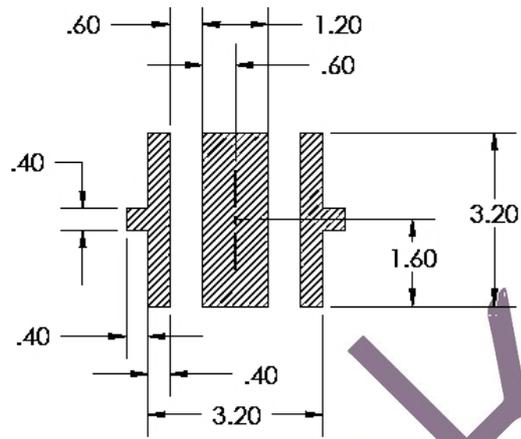
§ All dimensions are in millimeters.

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

■ Suggest Stencil Pattern (Recommendations for reference)



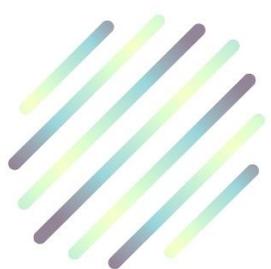
RECOMMENDED PCB SOLDER PAD



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

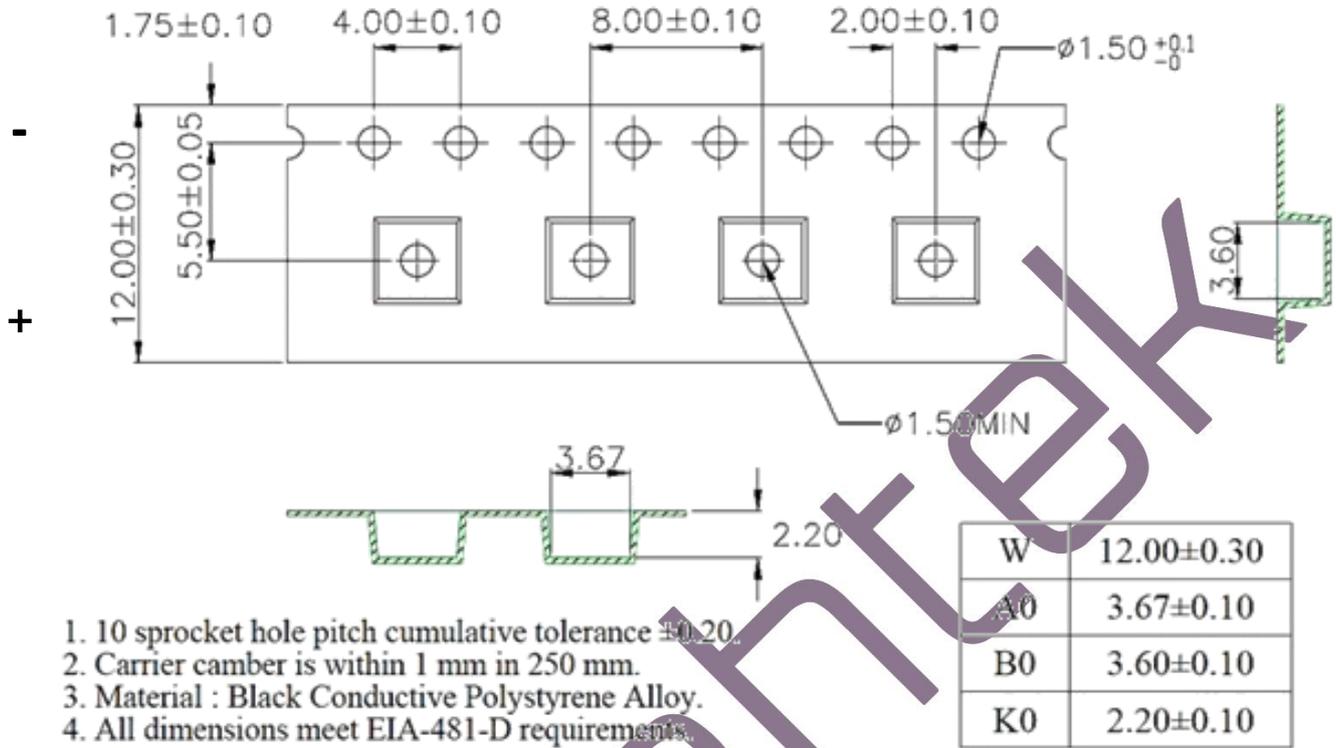
§ Suggest stencil $t = 0.12$ mm

BRIGHTTEK



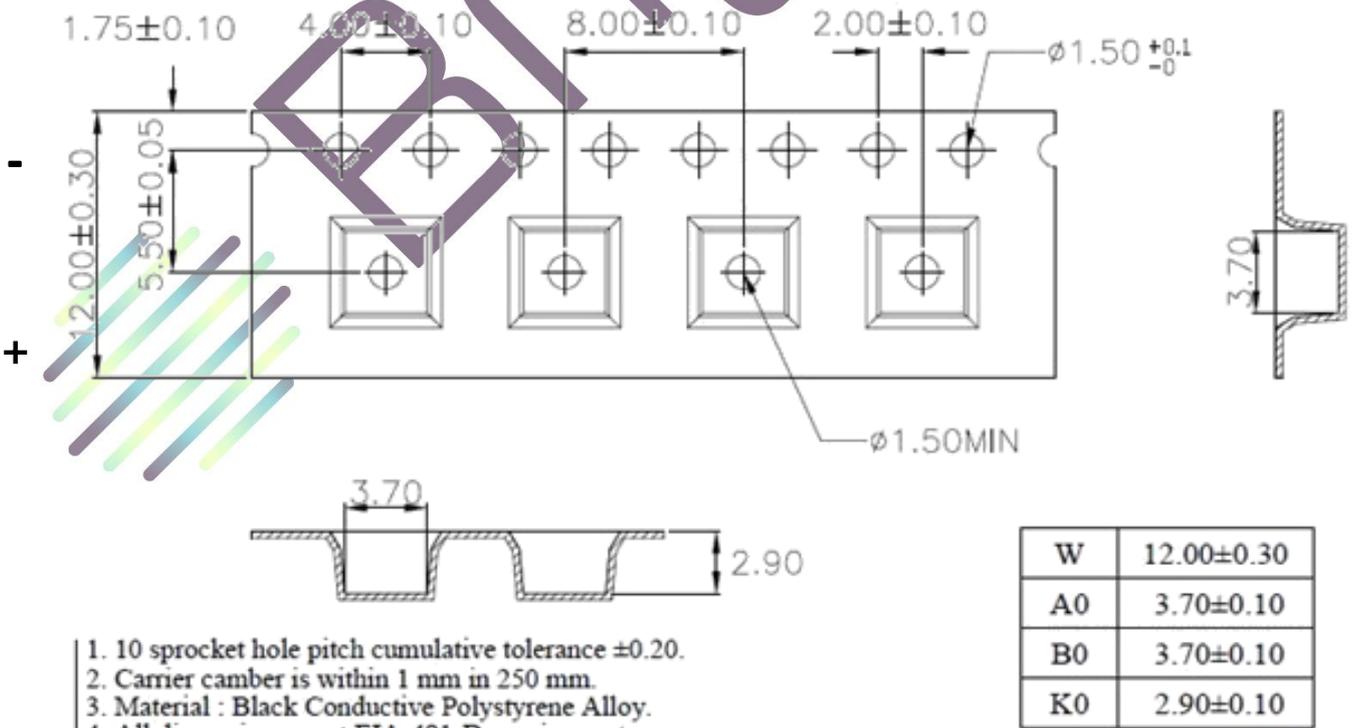
■ Packing

120°

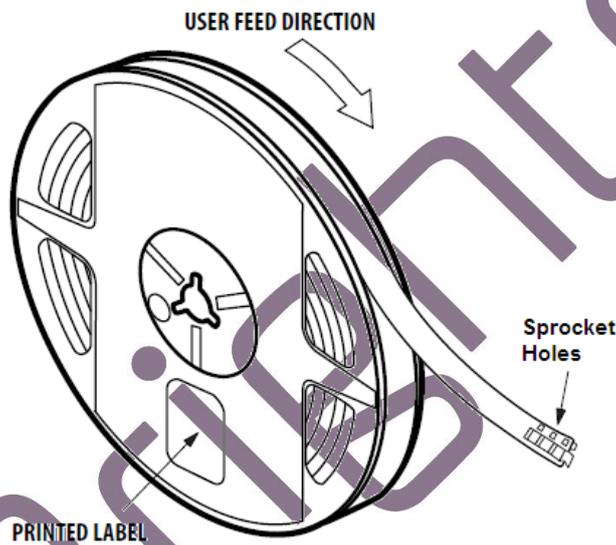
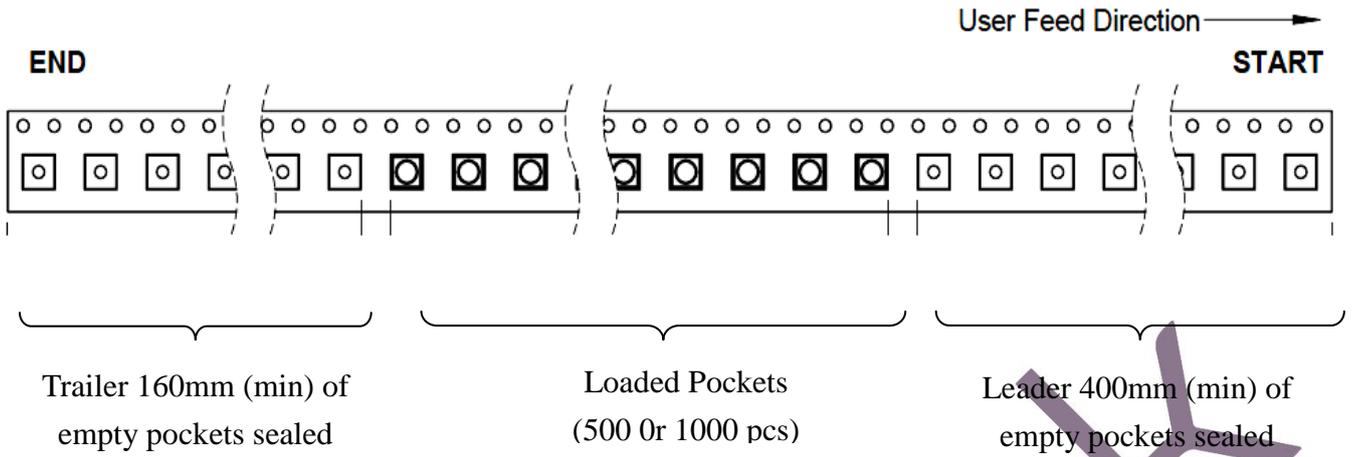


1. 10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30±0.05mm.

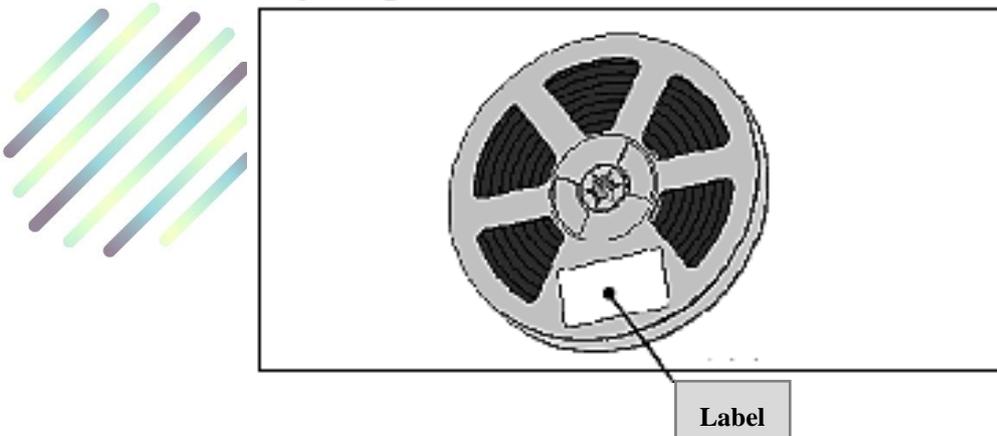
60°

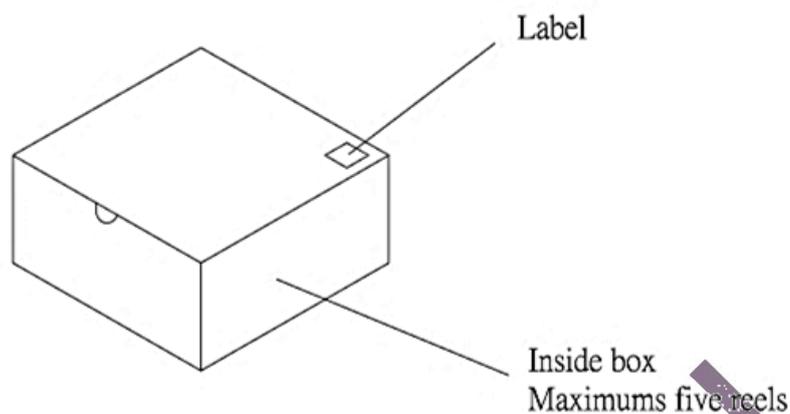


1. 10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30±0.05mm.



Unpackaged Reel



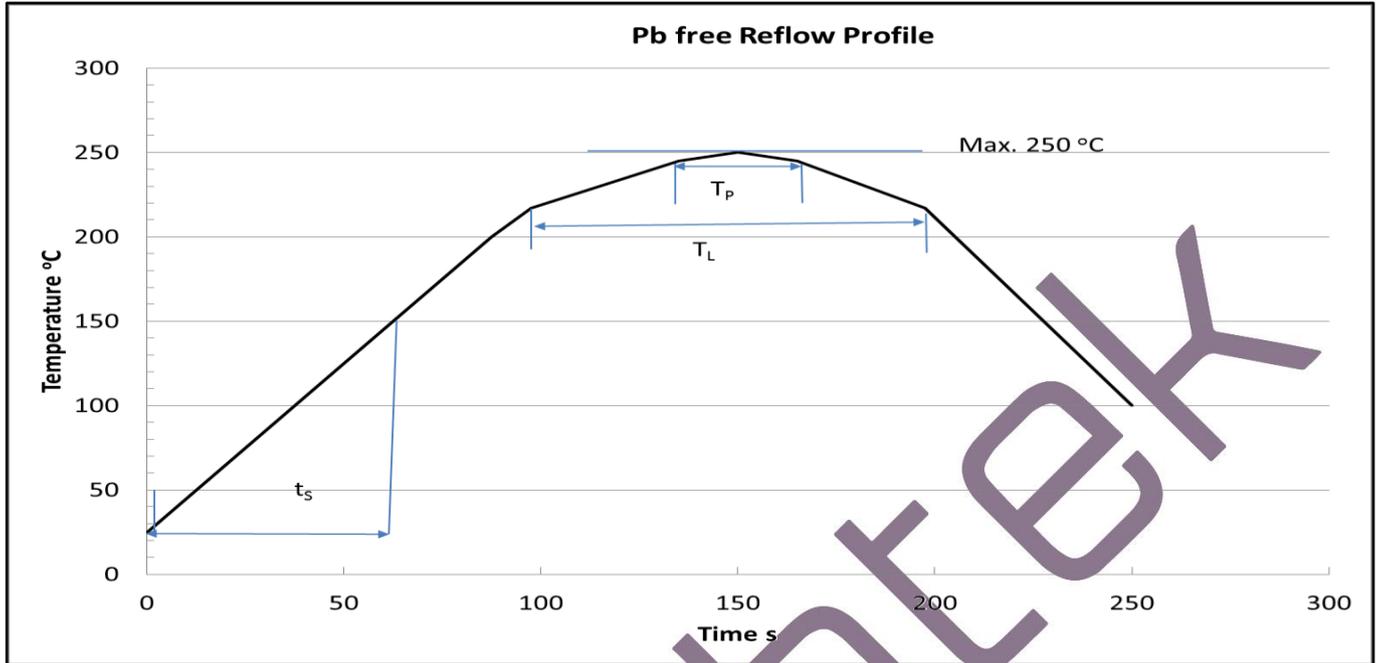
**Notes:**

1. Each reel (minimum number of pieces is 100 and maximum is 1000 for 120 degree product / 500 for 60 degree product) is packed in a moisture-proof bag along with a pack 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		250	250	°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 3 times.

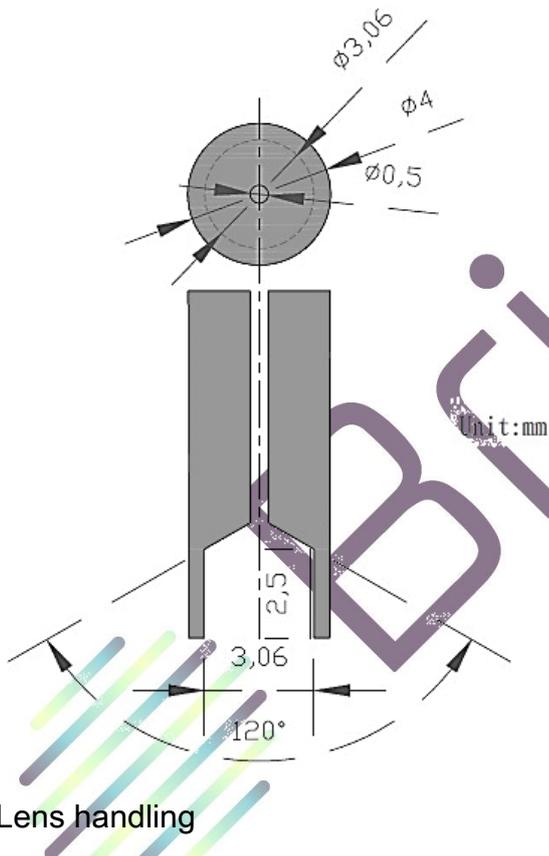
■ Precautions

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. Pick & place nozzle

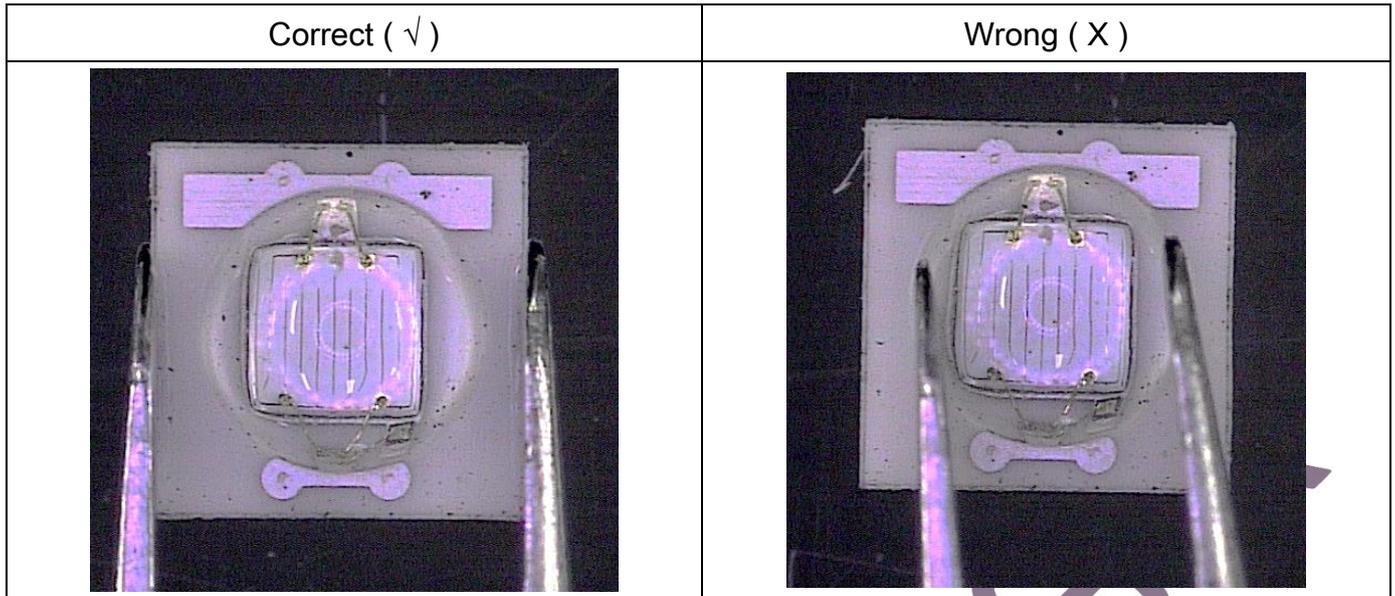
The pickup tool was recommended and shown as below



3. Lens handling

Please follow the guideline to pick LEDs.

- 3.1 Use tweezers to pick LEDs.
- 3.2 Do not touch the lens by using tweezers.
- 3.3 Do not touch lens with fingers.
- 3.4 Do not apply more than 4N (400gw) directly onto the lens.



4. Lens cleaning

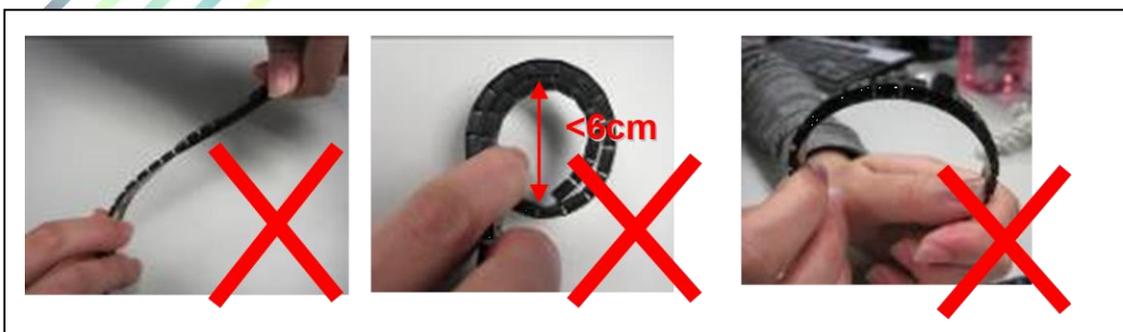
In the case which a small amount of dirt and dust particles remain on the lens surface, a suitable cleaning solution can be applied.

- 4.1 Try a gentle wiping with dust-free cloth.
- 4.2 If needed, use dust-free cloth and isopropyl alcohol to gently clean the dirt from the lens surface.
- 4.3 Do not use other solvents as they may directly react with the LED assembly.
- 4.4 Do not use ultrasonic cleaning which will damage the LEDs.

5. Carrier tape handling

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

- 5.1 Do not twist the carrier tape.
- 5.2 The inward bending diameter should not be smaller than 6cm for each carrier tape.
- 5.3 Do not bend the tape outward.



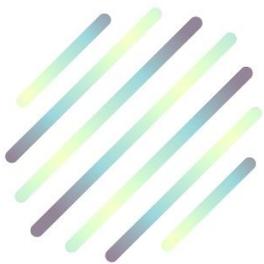
6. Storage

6.1 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.

6.2 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.



Brightek

■ 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	100 cycles	0/22	AEC-Q101
High Temperature Storage	T _a =100°C	1000 hrs	0/22	EIAJ ED-4701 200 201
Humidity Heat Storage	T _a =85°C RH=85%	1000 hrs	0/22	EIAJ ED-4701 100 103
Low Temperature Storage	T _a =-40°C	1000 hrs	0/22	EIAJ ED-4701 200 202
Life Test	T _a =25°C I _f =350mA	1000 hrs	0/22	
High Humidity Heat Operation	85°C RH=85% I _f =350mA	1000 hrs	0/22	
High Temperature Operation	T _a =85°C I _f =350mA	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 _F	I _f =350mA	-	USL ¹ ×1.1
Reverse Current	I _R	V _R =5V	-	100μA
Luminous Intensity	I _v	I _f =350mA	LSL ² ×0.7	-

Notes:

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