

VZK1BBBF37CO01Z4

- ◆ Outline : 14.5*8.0*6.5mm
- ◆ High flux efficiency
- ◆ Good thermal dissipation & optical uniformity



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Features

- Typical viewing angle 50% Iv: 40°
- RoHS and REACH-compliant
- MSL 3 qualified according to J-STD 020D
- ESD 2KV (HBM : MIL-STD-883D)

Applications

- Infrared illumination for CCTV
- Driver assistance systems

■ Product code method

V - Z - K1BB - B - F37C - O - 0 - 1 - 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
V: Eutectic process	Z: SMD LED	K1BB: K1 black shell silver-plating	B: 60°	Fxxx: Emission pipe production

⑥	⑦	⑧	⑨	⑩
Support code	Zener & High CRI	Cap color code	Module & Lens code	Current code
O: K1 substrate	0: None Zener	1: Series No.	Z: Molding	4: 350mA

■ Ordering information

Product code	Color	W_p (nm)
VZK1BBBF37CO01Z4	F3	840-870

Brightek

■ Maximum rating (Ta=25°C)

Characteristics	Symbol	Typical	Unit
DC Forward Current ¹	I _F	350	mA
Maximum Forward Current	I _{max}	1000	mA
Pulse Forward Current ²	I _{PF}	1800	mA
Reverse Voltage	V _R	-5	V
Junction Temperature ³	T _j	115	°C
Operating Temperature Range	T _{op}	-40-80	°C
Storage Temperature Range	T _{stg}	-40-100	°C
Soldering Temperature	T _{sol}	190	°C

Notes:

1. For other ambient, limited setting of current will be depended on de-rating curves.
2. D=0.01s duty 1/10.
3. When drive on maximum current , must keep T_j below 115°C .

■ Typical product characteristics (Ta=25°C)
VZK1BBBF37CO01Z4(VDK1BBBF37CO01Z4)

Characteristics		Symbol	Minimum	Typical	Maximum	Unit
Forward Voltage		V_F		1.5	2.4	V
Binning Forward Current		I_F		350		mA
Radiant Intensity	350mA	I_e	200	250	300	mW/sr
	1000mA	I_e	525	675	810	mW/sr
Radiant Flux	350mA	P_o	200	250	300	mW
	1000mA	P_o	525	675	810	mW
Leakage Current (5V)		I_R			10	μ A
Viewing Angle		$2\theta_{1/2}$		40		Deg
Wavelength (350mA)		W_p	840		870	nm
Thermal Resistance Junction / Solder Point		R_{th}		8		$^{\circ}$ C/W

Notes:

1. Forward voltage (V_F) $\pm 0.1V$, Radiant Flux (P_o) $\pm 10\%$, Viewing angle($2\theta_{1/2}$) $\pm 5\%$, Wavelength (W_p) $\pm 2nm$.
2. IS standard testing.
3. Electrical-optical characteristics. (Ta=25°C)

■ Intensity binning

Bin code (350mA)	Min. P_o (mW)	Max. P_o (mW)
21	200	225
22	225	250
23	250	275
24	275	300

■ Forward voltage binning

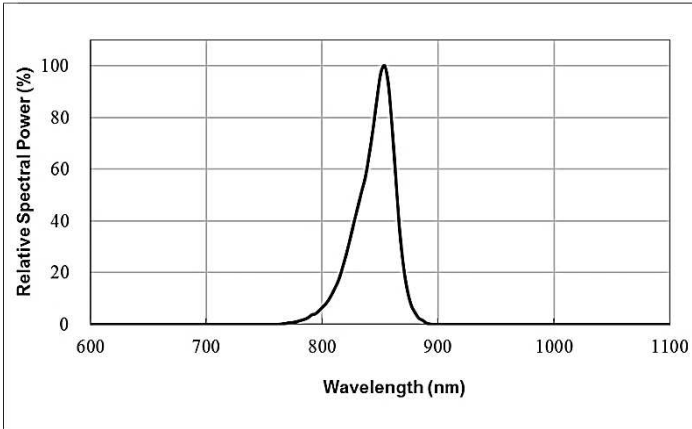
Bin code (350mA)	Min. V_F (V)	Max. V_F (V)
C	1.4	1.6
D	1.6	1.8
E	1.8	2.0
F	2.0	2.2
G	2.2	2.4

■ Wavelength binning

Bin code (350mA)	Min. W_p (nm)	Max. W_p (nm)
IR	840	870

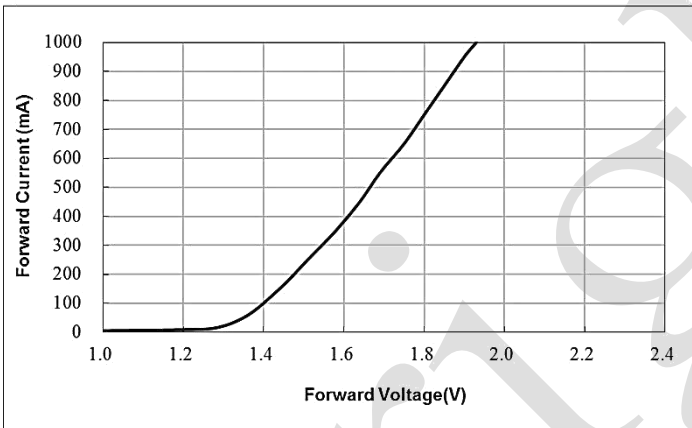
■ **Relative spectral power distribution**

Relative spectral power vs. Wavelength

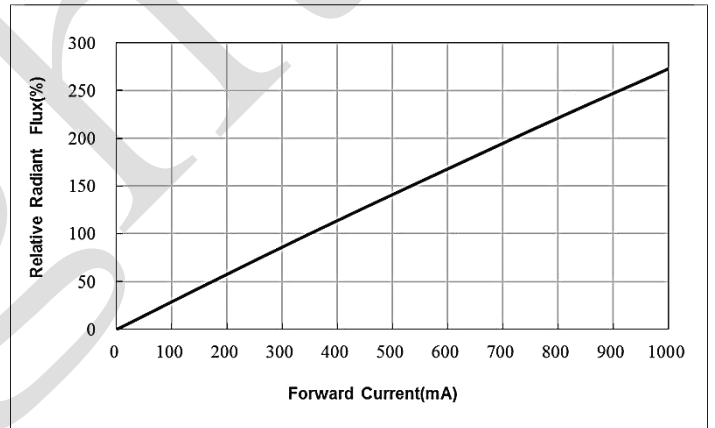


■ **Electronic-optical characteristics**

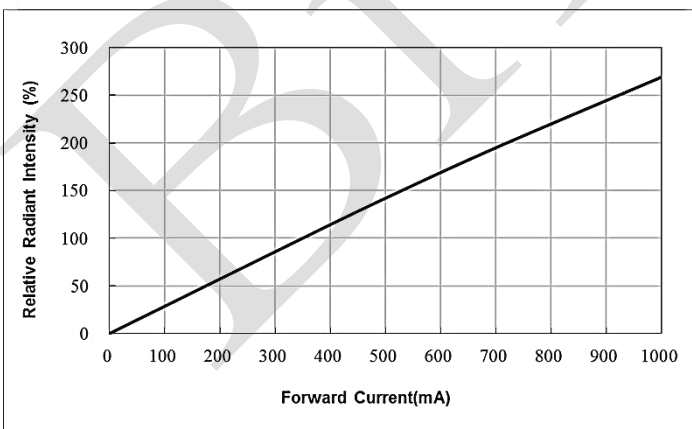
Forward Current vs. Forward Voltage (Ta=25°C)



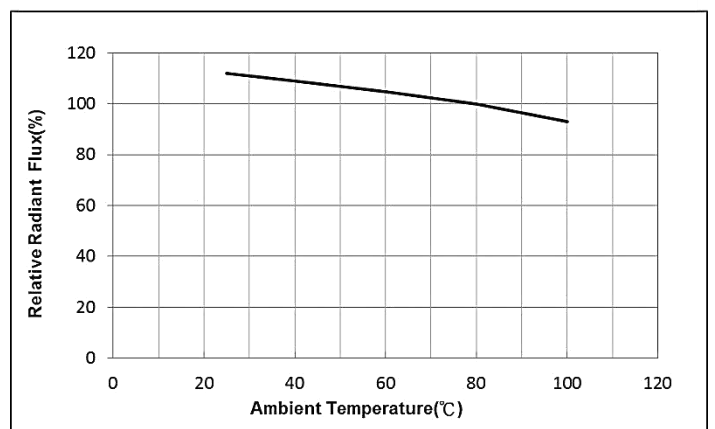
Relative Radiant Flux vs. Forward Current (Ta=25°C)



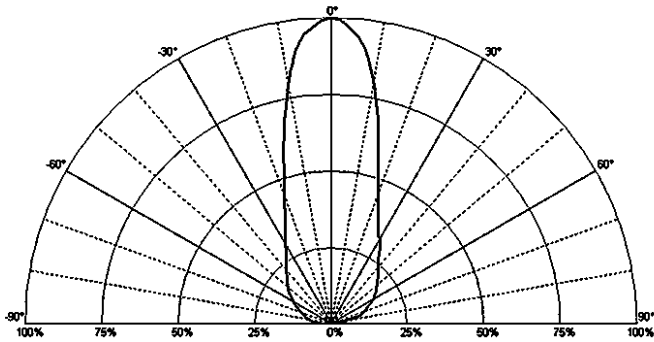
Relative Radiant Intensity vs. Forward Current (Ta=25°C)



Relative Radiant Flux vs. Ambient Temperature (If=350mA)

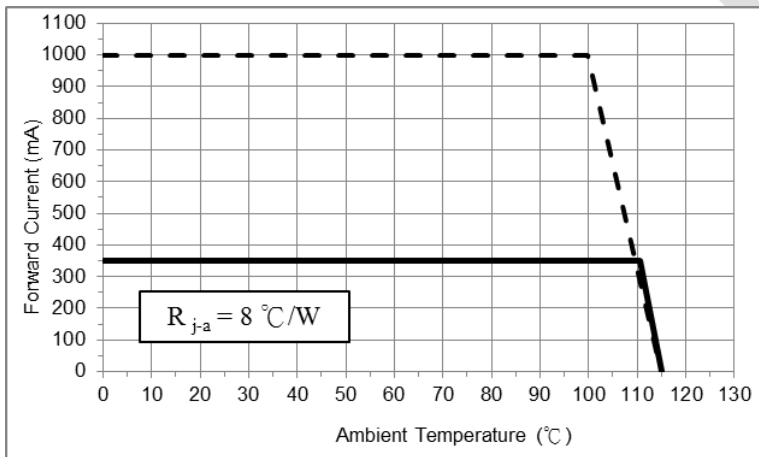


■ Typical spatial distribution

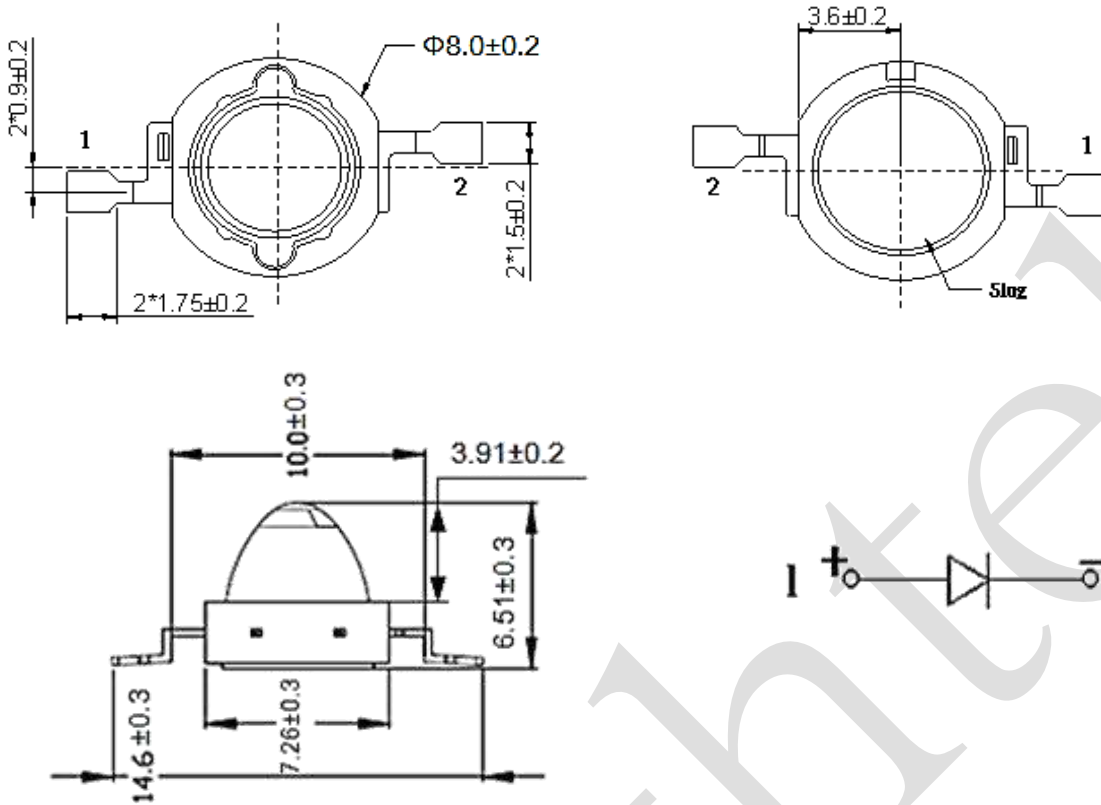


■ Thermal design for de-rating

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.

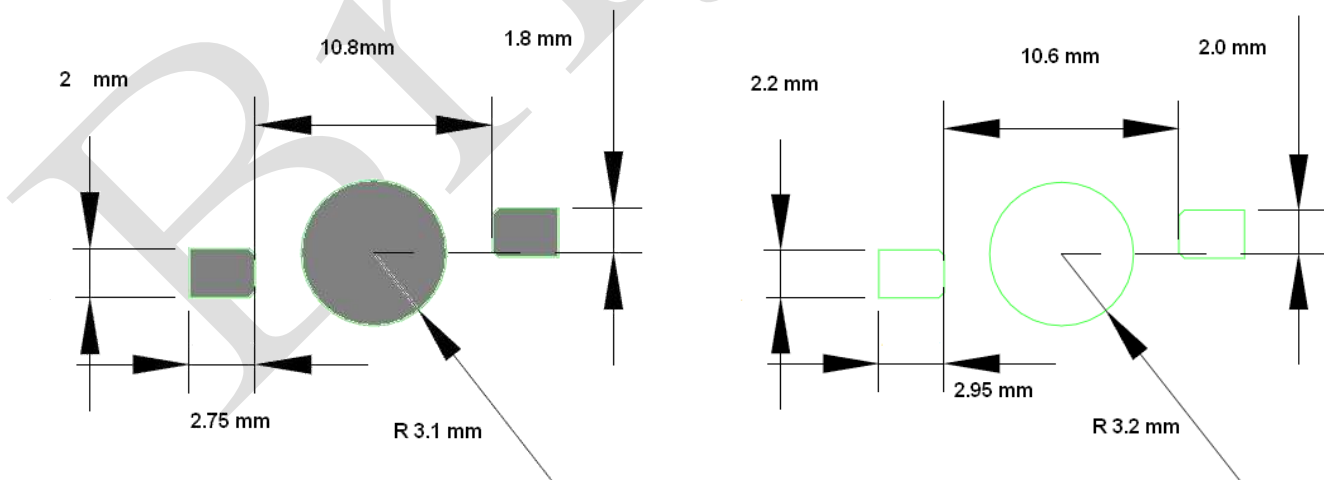


■ **Dimensions**



- § All dimensions are in millimeters.
- § Tolerance is ± 0.13 mm unless other specified.

■ **Suggest stencil pattern (Recommendations for reference)**

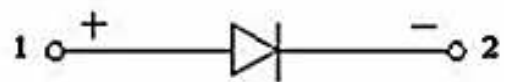
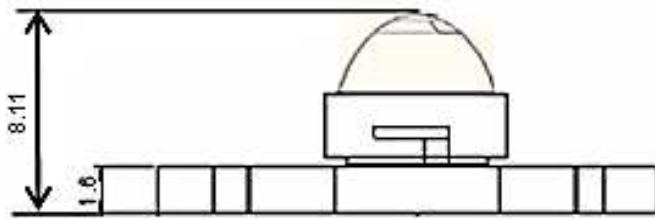
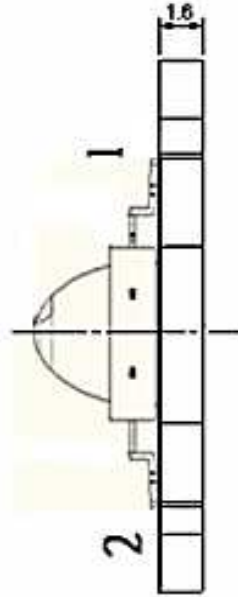
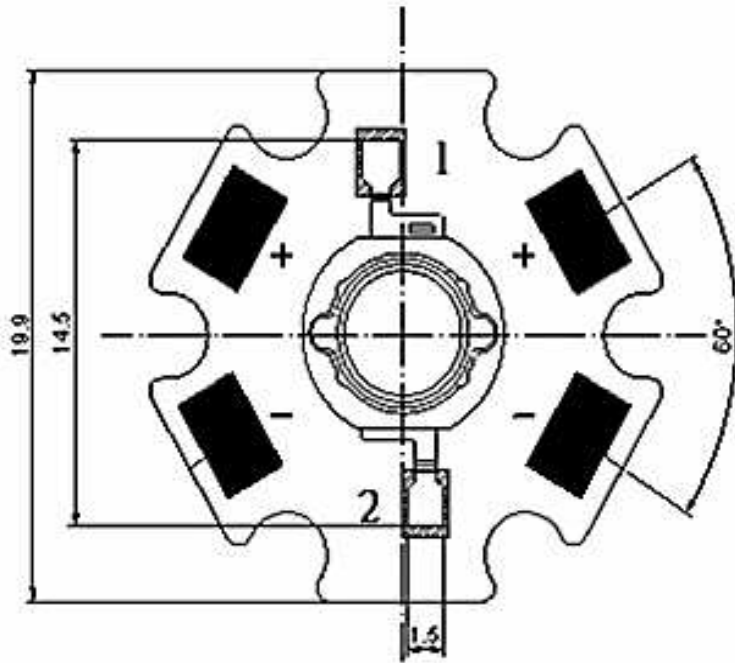


Recommended Stencil Pattern Pad
(Hatched area is opening)

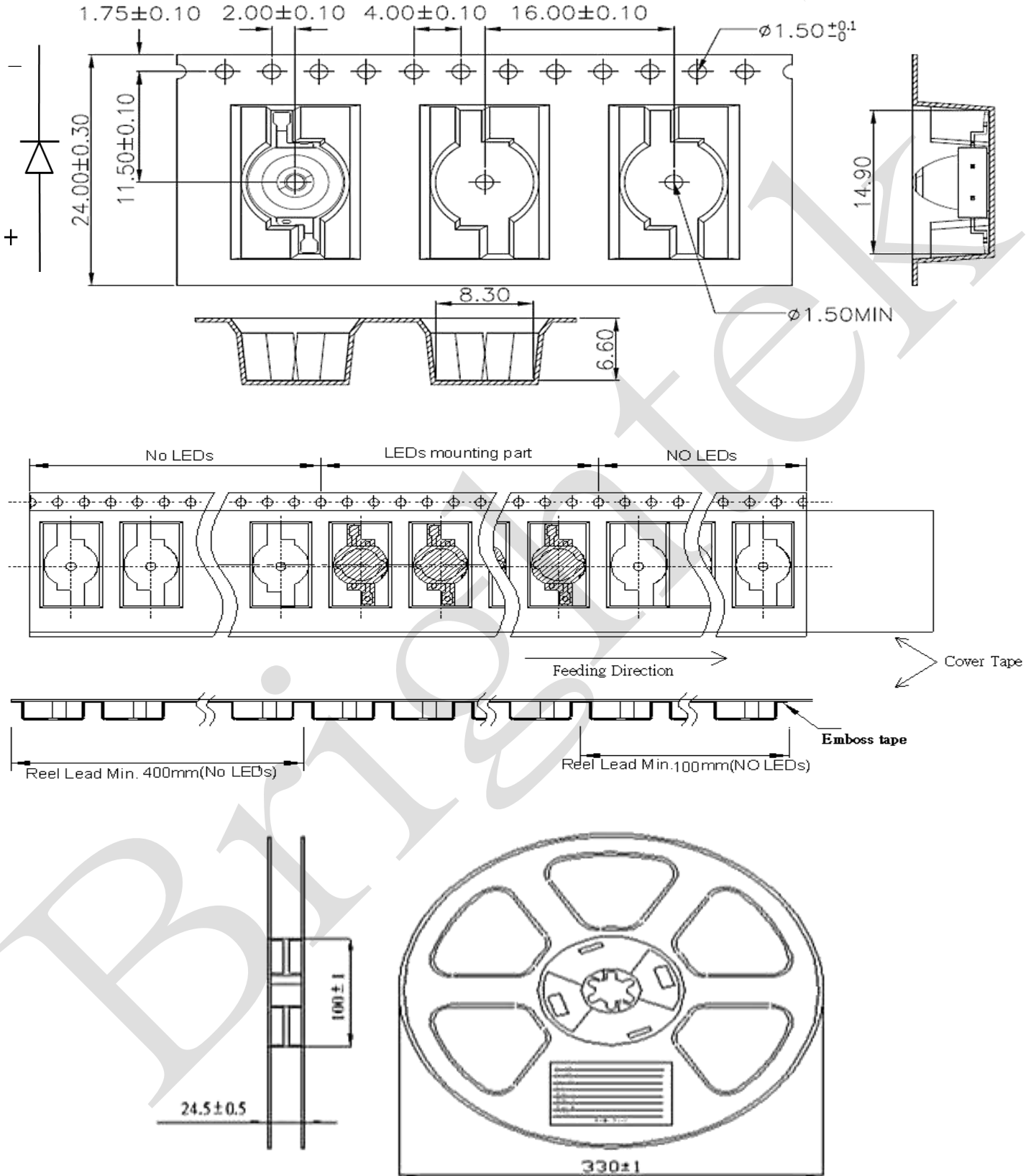
Recommended PCB Solder Pad

- § Suggest stencil $t = 0.12$ mm

■ Star Package Outline Drawing



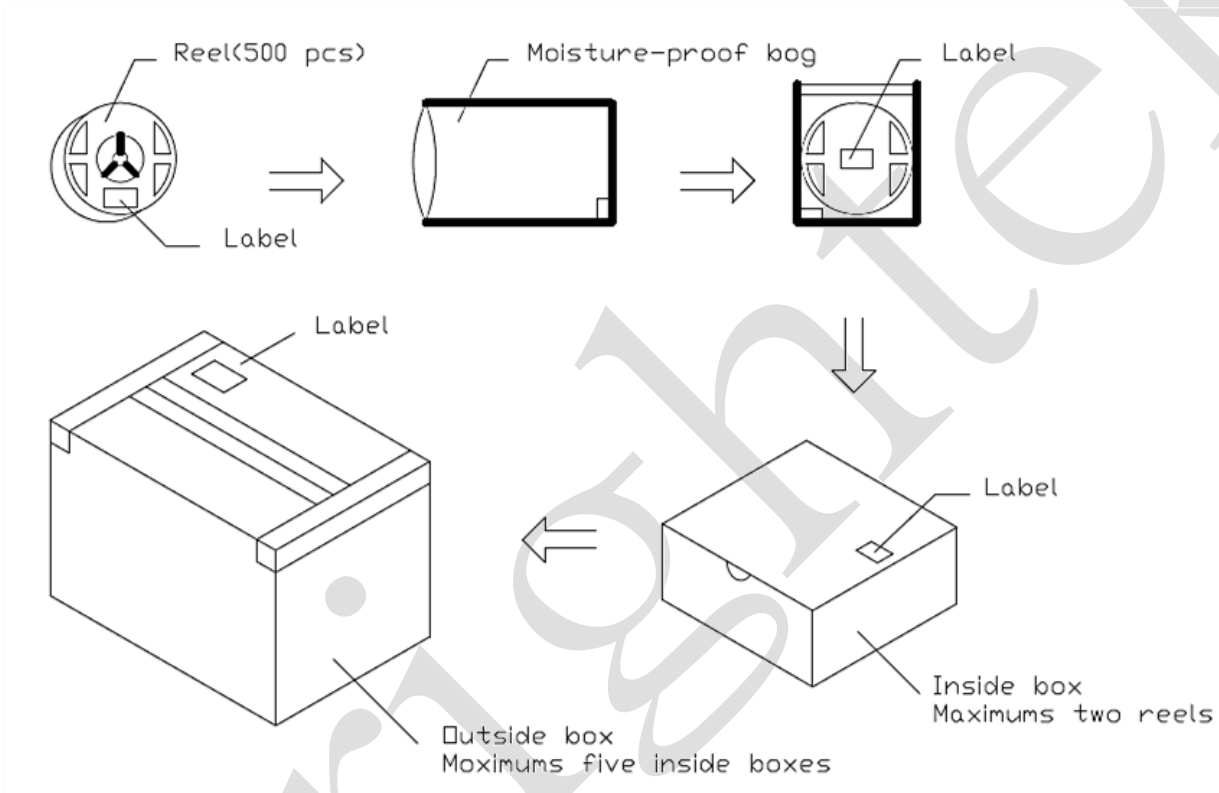
■ **Packing**



Notes:

1. Empty component pockets are sealed with top cover tape;
2. The maximum number of missing smds is two;
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications;
4. 500pcs/Reel

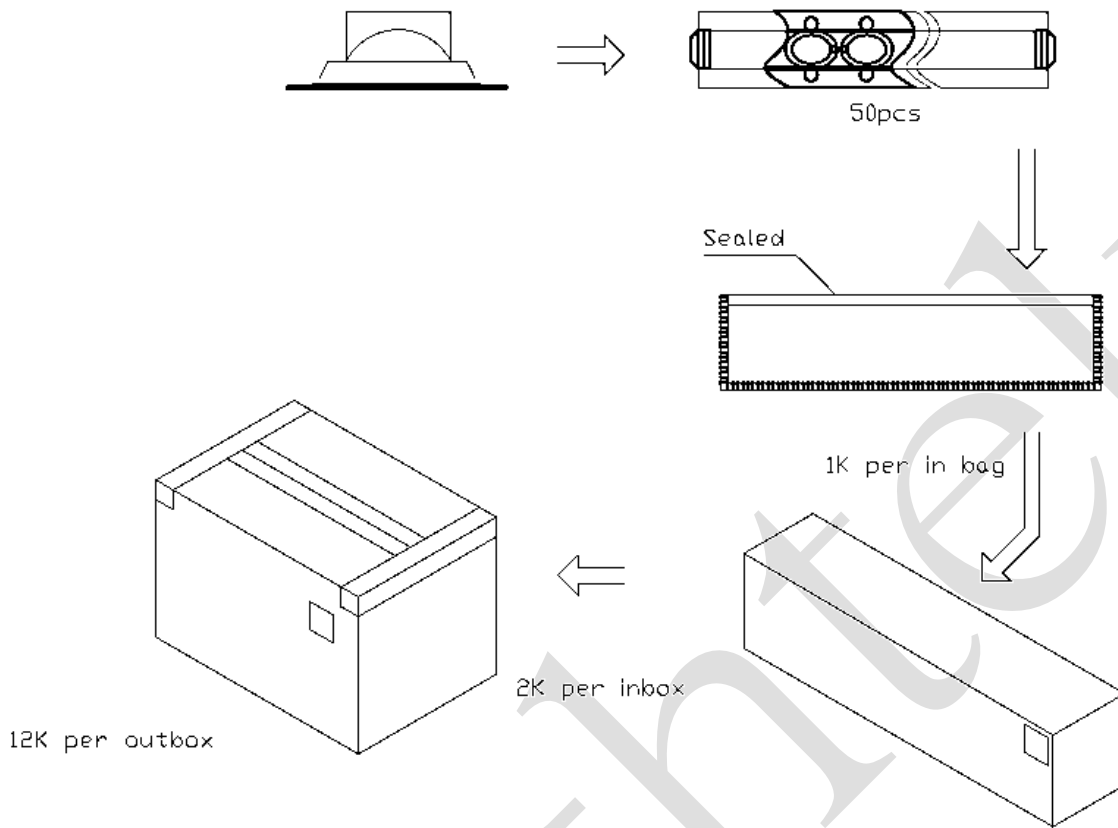
Packaging specifications 1



Notes:

Reeled products (numbers of products minimum are 100pcs, maximum are 1000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, five moisture-proof bag of maximums packed in an inside box (size: about 240mm x about 195mm x about 100mm) and four inside boxes of maximums are put in the outside box (size: about 410mm x about 255mm x about 240mm) Together with buffer material, and it is packed. (Part No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the insertion request form on the cardboard box.) .

Packaging specifications 2



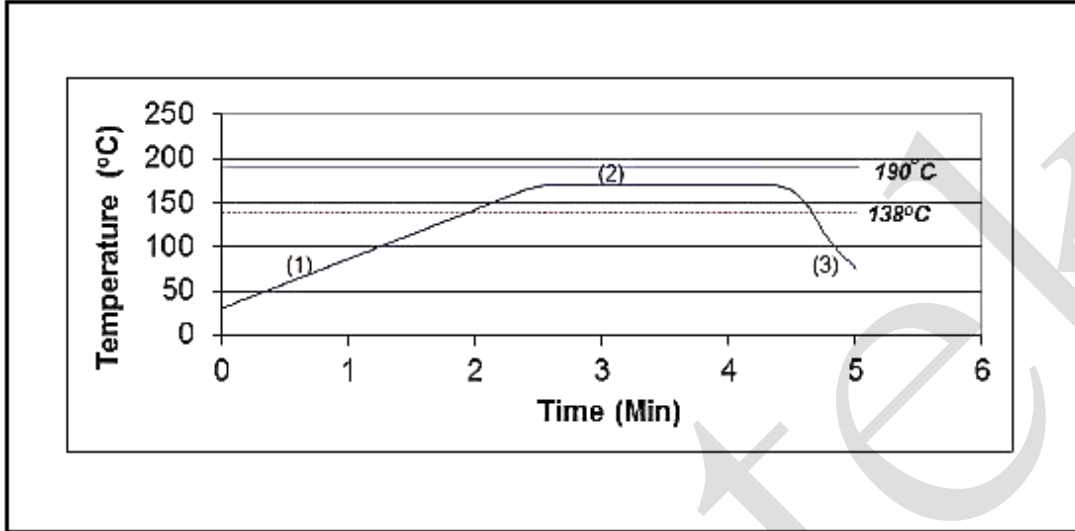
Notes:

Products are (the most quantity of products are 50pcs) packed in a tube along with a desiccant one by one, 40 tube of maximums (total maximum quantity of products are 2,000pcs) packed in an inside box (size: about 450mm x about 80mm x about 90mm) and six inside boxes of maximums are put in the outside box (size: about 470mm x about 270mm x about 210mm) Together with buffer material, and it is packed.(Part No., Lot No., quantity should appear on the label on the tube, part No. And quantity should appear on the insertion request form on the cardboard box.) .

■ Reflow profile

IR reflow soldering Profile

Lead Free solder



Profile Feature	Eutectic Assembly
(1) Preheat	0.5~1.0°C / second 120-150 seconds
(2) Soak and reflow	170~190°C 90-120 seconds
(3) Cooling stage	-3~4°C / second 30-60 seconds

Notes:

1. We recommend the reflow temperature 180°C(±5°C).the maximum soldering temperature should be limited to 190°C.
2. Don't stress the silicone resin while it is exposed to high temperature.
3. Number of reflow process shall be 1 time.
4. Recommend solder:
 - 1.TAMURA-TLF-401-11
 2. PF602-P

Contact information: Dong Guan Shen Mao Soldering Tin Co., Ltd.

Address: The 2nd IInd. Area Jiumen Village Hu Men Town Dong Cuan City, China , P.R.C

Tel: +86-769-8550-8193

Fax: +86-769-8550-4789

■ Precautions

1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 It is recommended to store the products in the following conditions:

Humidity(max): 60% R.H.

Temperature : 5°C ~30°C (41°F ~86°F)

2.2 Shelf life in sealed bag: 12 month at <5°C ~30°C and <30% R.H. after the package is Opened, the products should be used within a week or they should be keeping to stored at ≤ 20 R.H. with zip-lock sealed.

3. Baking

It is recommended to baking before soldering when the pack is unsealed after 24hrs. The Conditions are as followings:

3.1 70±3°C x 24hrs and <5%RH, taped reel type

3.2 100±3°C x 2hrs , bulk type

4. SMT Collet

4.1 Abnormal situation caused by improper setting of collet

To choose the right collet is the key issue in improving the product's quality. LED is different from other electronic components, which is not only about electrical output but also for optical output. This characteristic made LED more fragile in the process of SMT. If the collet's lowering down height is not well set, it will bring damage to the gold wire at the time of collet's picking up and loading which will cause the LED fail to light up, light up now and then or other quality problems.

4.2 How to choose the collet

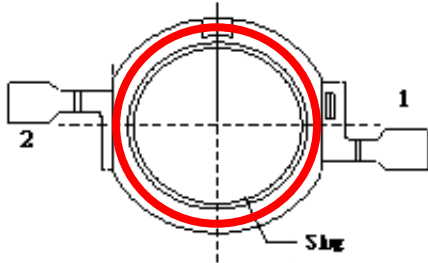
During SMT, please choose the collet that has larger outer diameter than the lighting area of lens, in case that improper position of collet will damage the gold wire inside

the LED. Different collets fit for different products, please refer to the following pictures

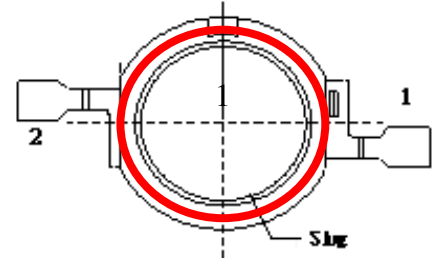
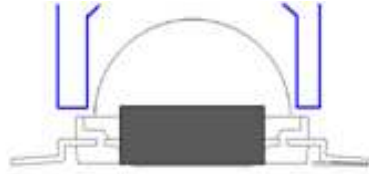
cross out:.

Outer diameter of collet should be larger than the lighting area

Outer diameter of collet



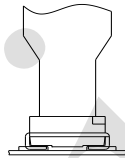
Picture 1 (✓)



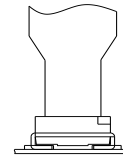
Picture 2 (✗)

4.3 How to set the height of collet

The reason why for top view SMD, the height of collet before it presses downward will directly affect the quality of products during SMT is that if the collet go down too much, it will press lens and cause the distortion or breaking of gold wire. The setting of collet position should follow the pictures bellowed.



Picture 3 (✓)



Picture 4 (✗)

4.4 Other points for attention

4.4.1 No pressure should be exerted to the epoxy shell of the SMD under high temperature.

4.4.2 Do not scratch or wipe the lens since the lens and gold wire inside are rather fragile and cross out easy to break.

4.4.3 LED should be used as soon as possible when being taken out of the original package, and should be stored in anti-moisture and anti-ESD package.

4.4.4 This usage and handling instruction is only for your reference. Do not bend the tape outward.

■ 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	AECQ101
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	Tested with Brightek standard
High Humidity Heat Life Test	85°C RH=85% I _f =350mA	1000 hrs	0/22	Tested with Brightek standard
High Temperature Life Test	T _a =85°C	1000 hrs	0/22	Tested with Brightek standard
ESD(HBM)	2KV at 1.5kΩ;100pf	3 Times	0/22	MIL-STD-883D

***Criteria for Judging the Damage**

Item	Symbol	Condition	Criteria for Judgement	
			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