BRIGHTEK OPTOELECTRONICS CO., LTD

SPECIFICATION FOR APPROVAL

Customer Part No:

Brightek Part No: Venus K1

- White: VZK1WCAW37FADQZ4
- Neutral White: VZK1WCAW57FADLZ4
- Warm White: VZK1WCAW57FADDZ4

Specification:

Documents No:

Prepared By: Kiwi / Time: 2012/09/25

Checked By: / Time:

Customer Confirmation:

Features

§ Eutectic chip bonding process
§ Forward maximum current 700mA
§ Low thermal resistance: 8℃/W
§ Wide viewing angle: Typ.145°
§ Operating temperature -30~80℃
§ Storage temperature-40~100℃
§ ROHS and REACH-compliant
§ Outline (L x W x H) of 14.5*8.0*5mm
§ Qualified according to JEDEC moisture Level 2
§ Reverse voltage: 5V

Catalog

BRIGHTEK

Electrical-Optical Characteristics（Ta=25℃）

Part Number Matrix

Color	Emitter
Cool White	VZK1WCAW37FADQZ4
Neutral White	VZK1WCAW57FADLZ4
Warm White	VZK1WCAW57FADDZ4

➢ Cool--White

Parameter	Symbol	Value			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	V_f		3.3	3.4	V	I_f=350mA
Reverse Current	I_r	---	---	10	μA	V_r=5V
Viewing angle	$2\theta_{1/2}$	---	145	---	Deg	If=350mA
Chromaticity coordinate	X	---	0.3287	---	---	If=350mA
	Y	---	0.3417	---	---	
Color Temperature	CCT	---	5700	---	K	If=350mA
Luminous Flux	Φv	---	130	---	Lm	If=350mA
Luminous Flux	Φv	---	230	---	Lm	If=700mA

1. Luminous intensity (Iv) ±5%, Forward Voltage (VF) ±0.05V
2. IS standard testing CRI >65

➢ Neutral --White

Parameter	Symbol	Value			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	V_f		3.3	3.4	V	I_f=350mA
Reverse Current	I_r	---	---	10	μA	V_r=5V
Viewing angle	$2\theta_{1/2}$	---	145	---	Deg	If=350mA
Chromaticity coordinate	X	---	0.3818	---	---	If=350mA
	Y	---	0.3797	---	---	
Color Temperature	CCT	---	4000	---	K	If=350mA
Luminous Flux	Φv	---	120	---	Lm	If=350mA
Luminous Flux	Φv	---	210	---	Lm	If=700mA

1. Luminous intensity (Iv) ±5%, Forward Voltage (VF) ±0.05V
2. IS standard testing CRI >70

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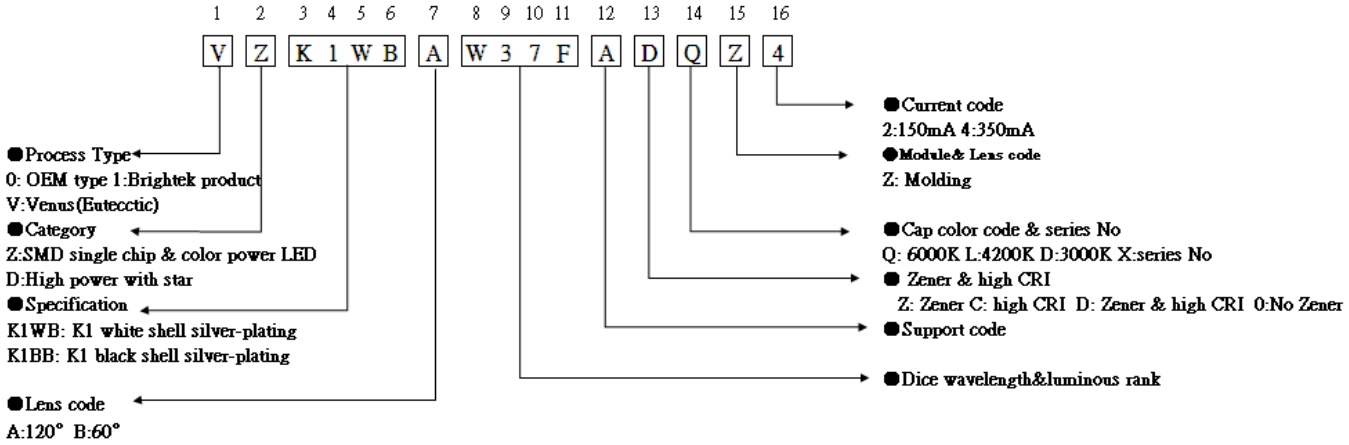
➢ Warm--White

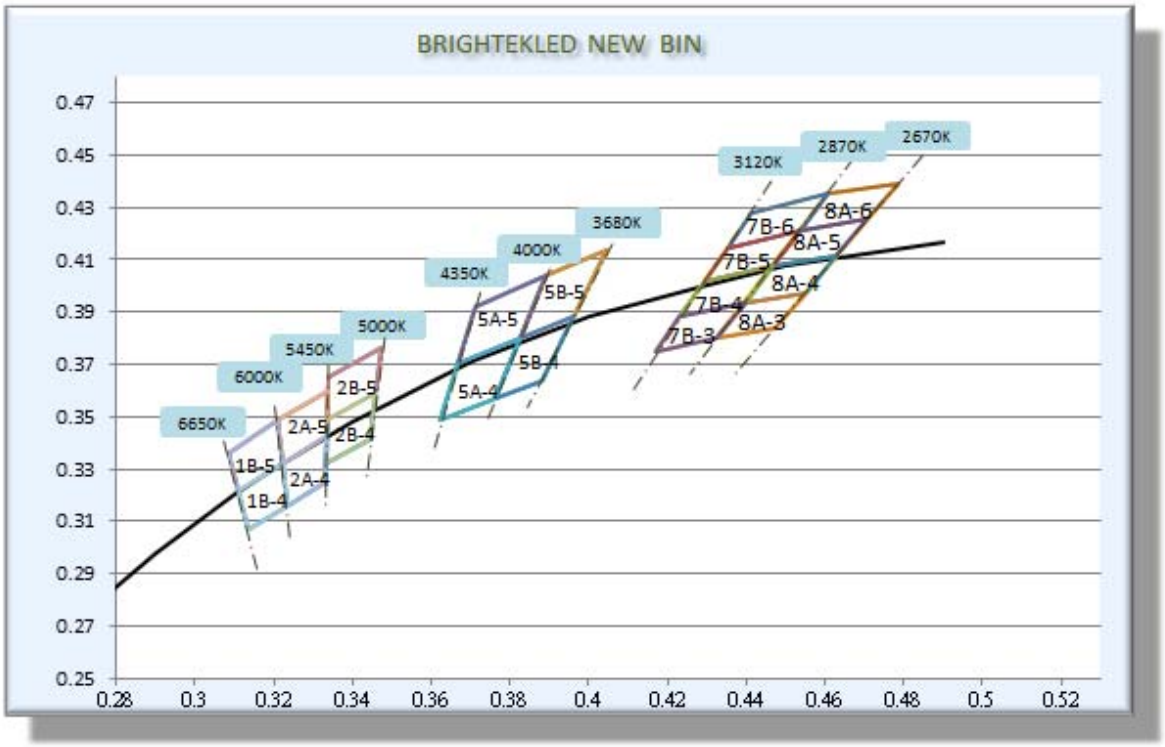
Parameter	Symbol	Value			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	V_f		3.3	3.4	V	I_f=350mA
Reverse Current	I_r	---	---	10	μA	V_r=5V
Viewing angle	$2\theta_{1/2}$	---	135	---	Deg	I_f=350mA
Chromaticity coordinate	X	---	0.4338	---	---	I_f=350mA
	Y	---	0.4030	---	---	
Color Temperature	CCT	---	2800	---	K	I_f=350mA
Luminous Flux	Φv	---	90	---	Lm	I_f=350mA
Luminous Flux	Φv	---	160	---	Lm	I_f=700mA

1. Luminous intensity (Iv) ±5%, Forward Voltage (VF) ±0.05V
2. IS standard testing CRI >80

High Power Product Identification Code



➢ COLOR COORDINATE (CIE-1931)



SPECIFICATION FOR APPROVAL

➢ PERFORMANCE GROUPS – CHROMATICITY

BIN	x	y	BIN	x	y	BIN	x	y
1B-5	0.3211	0.3485	2A-5	0.3340	0.3600	2B-5	0.3475	0.3763
	0.3088	0.3363		0.3211	0.3485		0.3341	0.3654
	0.3111	0.3216		0.3223	0.3322		0.3337	0.3489
	0.3223	0.3322		0.3335	0.3425		0.3459	0.3590
1B-4	0.3223	0.3322	2A-4	0.3335	0.3425	2B-4	0.3459	0.3590
	0.3111	0.3216		0.3223	0.3322		0.3337	0.3489
	0.3135	0.3070		0.3235	0.3160		0.3332	0.3323
	0.3235	0.3160		0.3330	0.3250		0.3443	0.3416

BIN	x	y	BIN	x	y
5A-5	0.3893	0.4037	5B-5	0.4046	0.4134
	0.3714	0.3924		0.3893	0.4037
	0.3669	0.3705		0.3828	0.3803
	0.3828	0.3803		0.3963	0.3887
5A-4	0.3828	0.3803	5B-4	0.3963	0.3887
	0.3669	0.3705		0.3828	0.3803
	0.3624	0.3486		0.3762	0.3569
	0.3762	0.3569		0.3881	0.3640

BIN	x	y	BIN	x	y
7B-6	0.4609	0.4352	8A-6	0.4788	0.4394
	0.4415	0.4281		0.4609	0.4352
	0.4354	0.4148		0.4538	0.4214
	0.4538	0.4214		0.4709	0.4254
7B-5	0.4538	0.4214	8A-5	0.4709	0.4254
	0.4354	0.4148		0.4538	0.4214
	0.4293	0.4014		0.4468	0.4077
	0.4468	0.4077		0.4630	0.4114
7B-4	0.4468	0.4077	8A-4	0.4630	0.4114
	0.4293	0.4014		0.4468	0.4077
	0.4232	0.3881		0.4397	0.3939
	0.4397	0.3939		0.4551	0.3975
7B-3	0.4397	0.3939	8A-3	0.4551	0.3975
	0.4232	0.3881		0.4397	0.3939
	0.4171	0.3748		0.4326	0.3801
	0.4326	0.3801		0.4472	0.3835

➢ PERFORMANCE GROUPS – BRIGHTNESS

Bin	E	F						
VF(v)	3.0-3.2	3.2-3.4						
Bin	31	32	33	34	35	36		
Flux(lm)	80-90	90-100	100-110	110-120	120-130	130-140		

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Optical Characteristics

Figure 1.Relative Radiant Power VS Wavelength @Ta=25℃

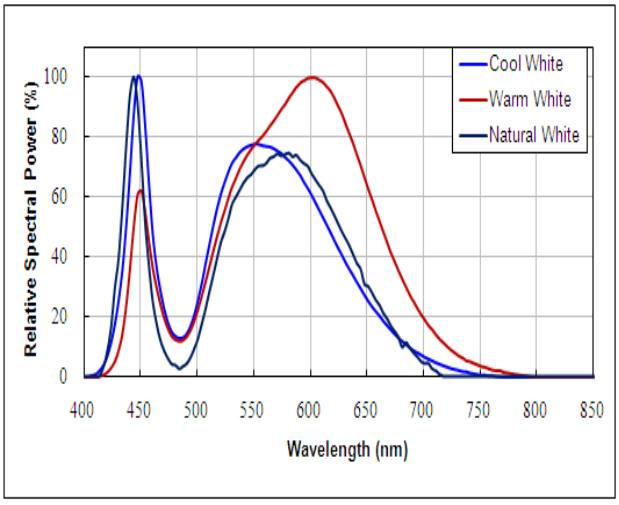


Figure 2. Forward Current VS Forward Voltage

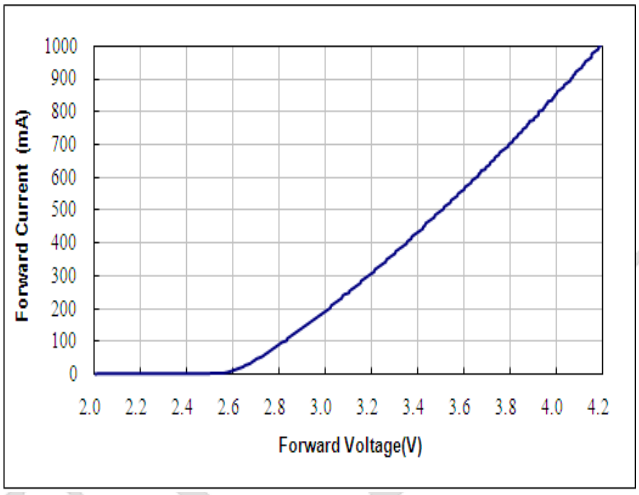


Figure 4. Relative Light Output VS Junction Temperature

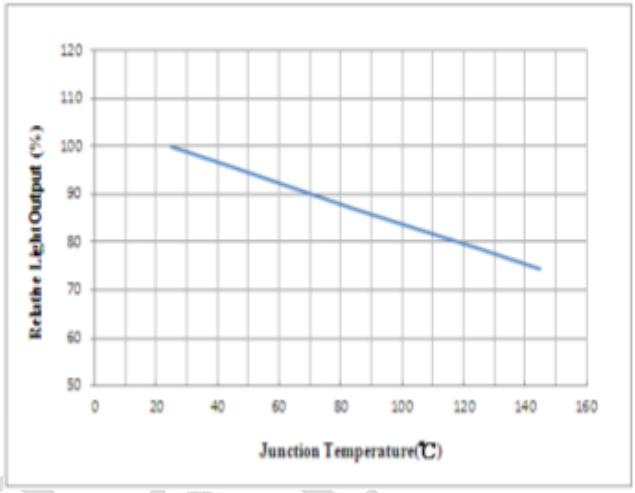


Figure 3. Relative Luminous Flux VS Forward Current @Ta=25℃

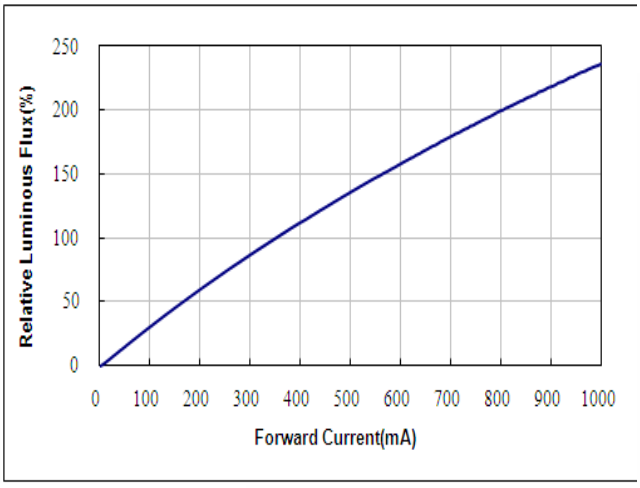


Figure 5. Forward Current VS Ambient Temperature @Tj=125℃

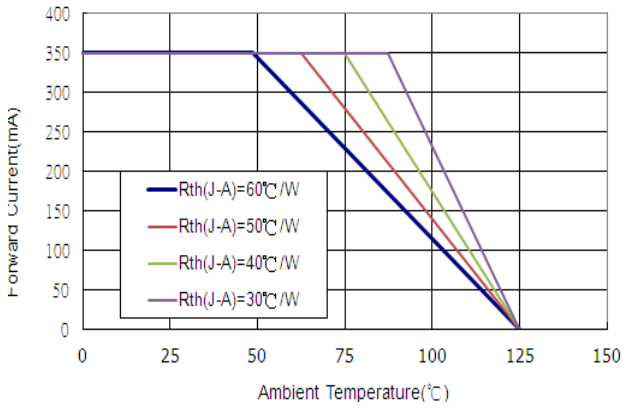
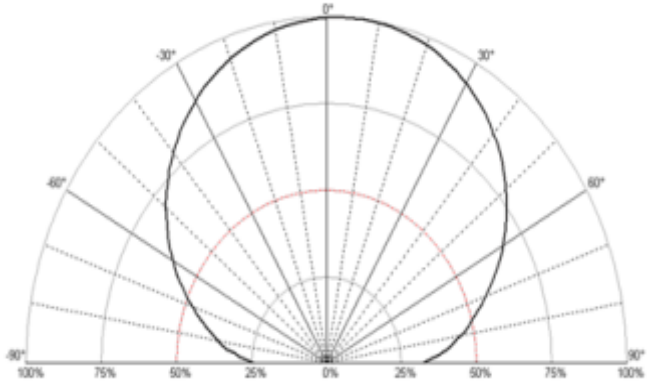
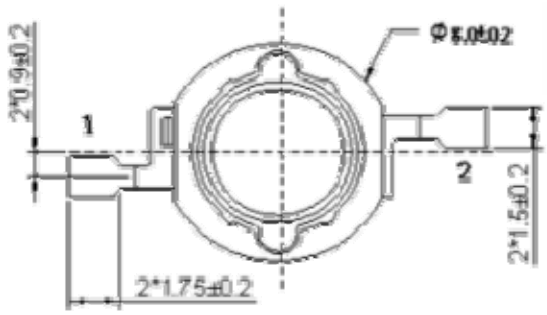
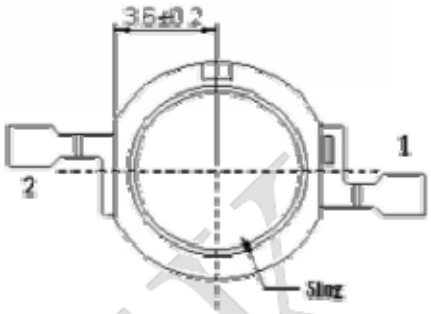


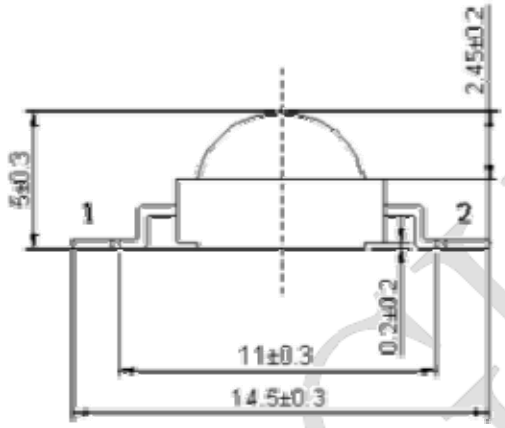
Figure 6. White Color Radiation Angle

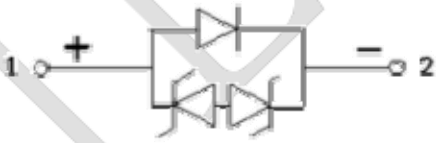


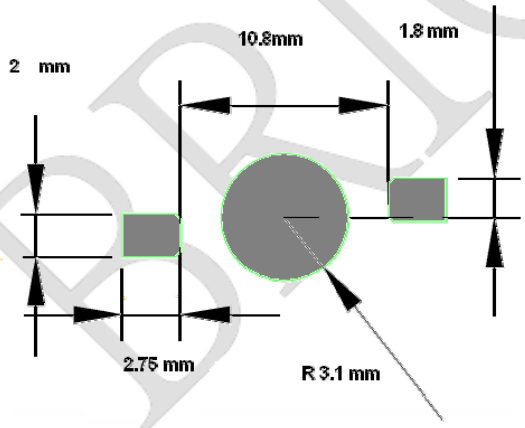
Outline Dimensions



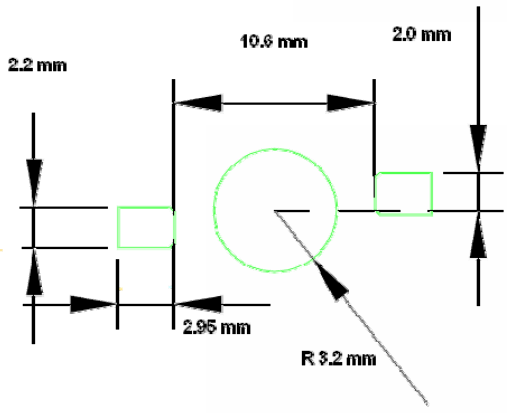








灰色部分為鋼板開口



綠圈部分為 PCB 或鋁基板 Pad 尺寸

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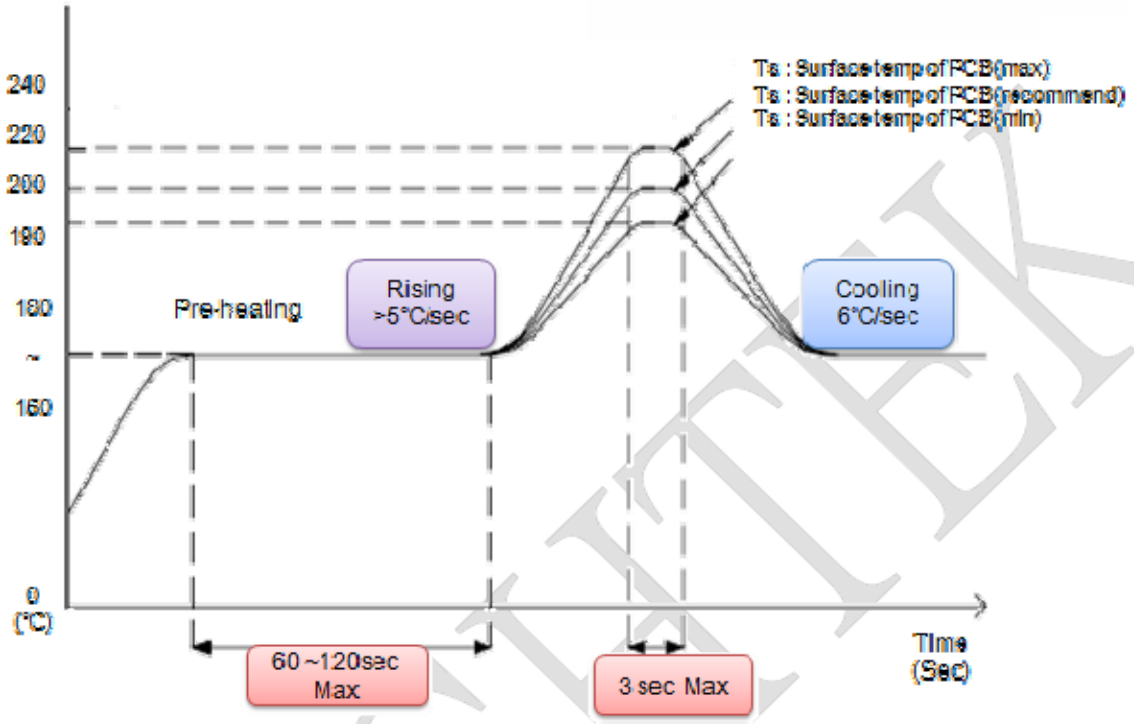
Reflow Profile

IR reflow soldering Profile

Lead Free solder



NOTES:

1. We recommend the reflow temperature 200℃(±10℃).the maximum soldering temperature should be limited to 220℃.
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: Recommend Solder:**

1.TAMURA-TLF-401-11

2. PF602-P

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Test items and results of reliability

Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
Temperature Cycle	–40℃ 30min ↑↓25℃(5 min) 100℃ 30min	100 cycles	0/22	JEITA ED-4701 300 303
Thermal Shock	–40℃ 30min ↑↓5sec 110℃ 30min	100 cycles	0/22	JEITA ED-4701 200 303
High Temperature Storage	T_a=85℃	1000 hrs	0/22	EIAJED-4701 200 201
Humidity Heat Storage	T_a=85℃ RH=85%	1000 hrs	0/22	EIAJED-4701 100 103
Low Temperature Storage	T_a=-40℃	1000 hrs	0/22	EIAJED-4701 200 202
Life Test	T_a=25℃ If=500mA	1000 hrs	0/22	Tested with Brightek standard
High Humidity Heat Life Test	60℃ RH=90% If=500mA	1000 hrs	0/22	Tested with Brightek standard
Low Temperature Life Test	T_a=-40℃ If=500mA	1000 hrs	0/22	Tested with Brightek standard
ESD(HBM)	1KV 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	*VF*	*If=350mA*	_	USL*[1]×1.1
Reverse Current	*IR*	VR=5V	_	100μA
Luminous Intensity	*Iv*	*If=350mA*	LSL*[2]×0.7	_

[Note]*[1]USL: Upper Specification Level

*[2] LSL: Lower Specification Level

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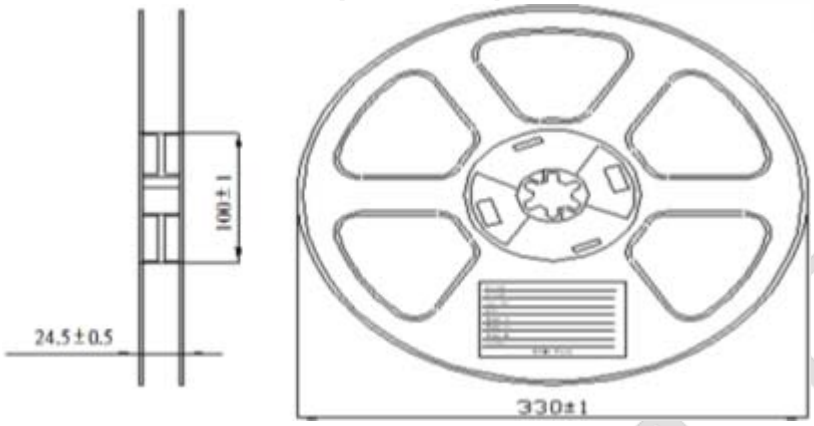
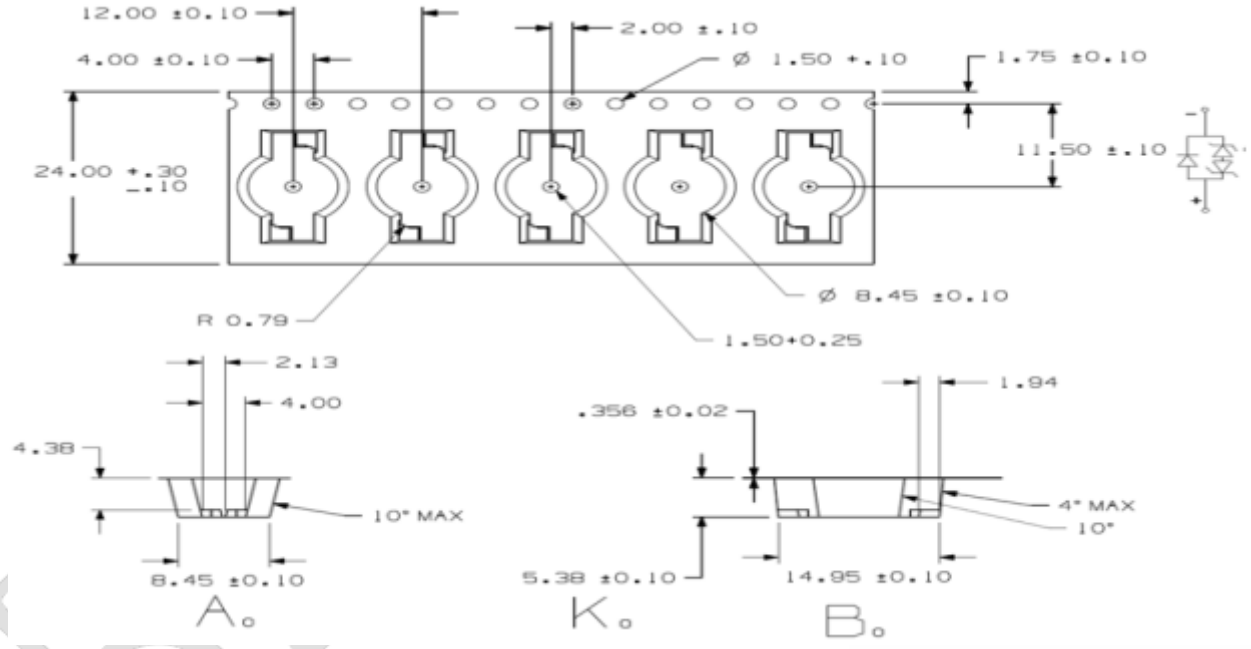
Packing

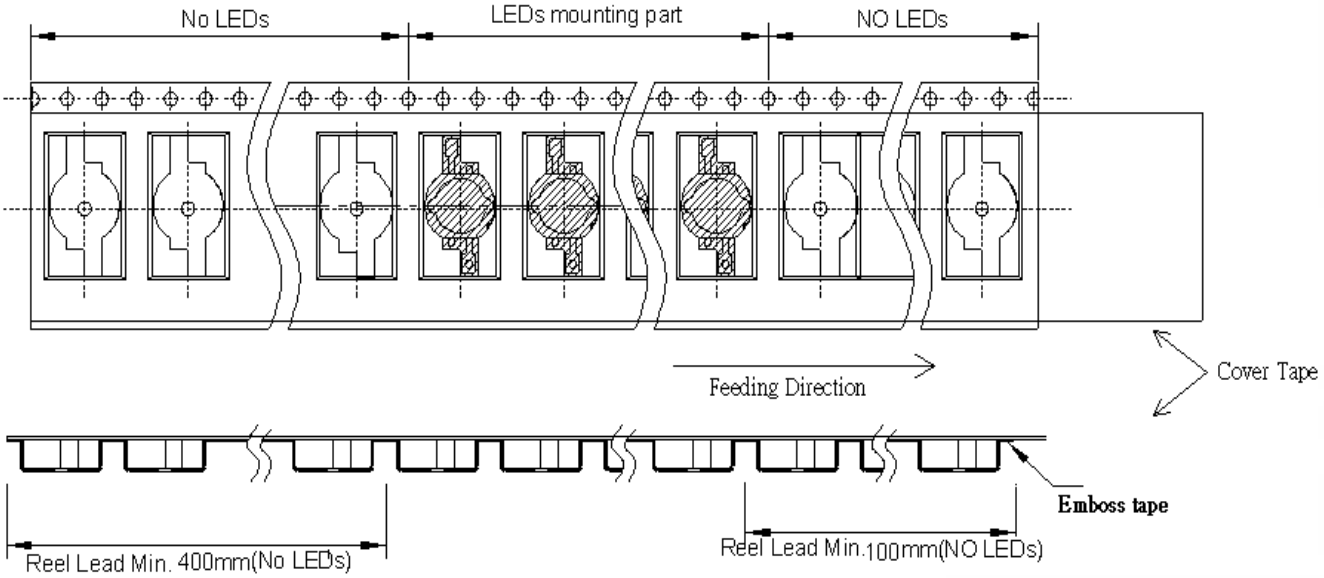
A. Dimensions of Reel (Unit: mm)



B. Dimensions of Tape (Unit: mm)



C. Arrangement of Tape

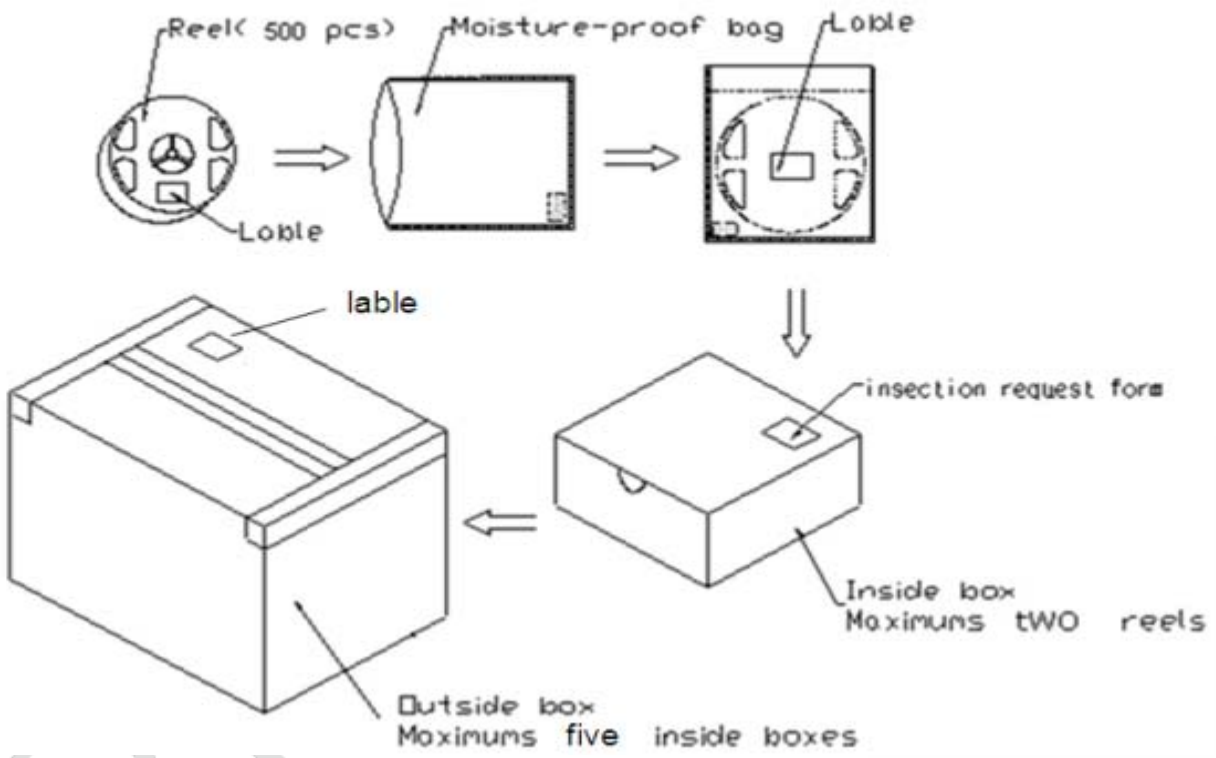


NOTES

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

White Color High Power LEDs Packaging Specifications

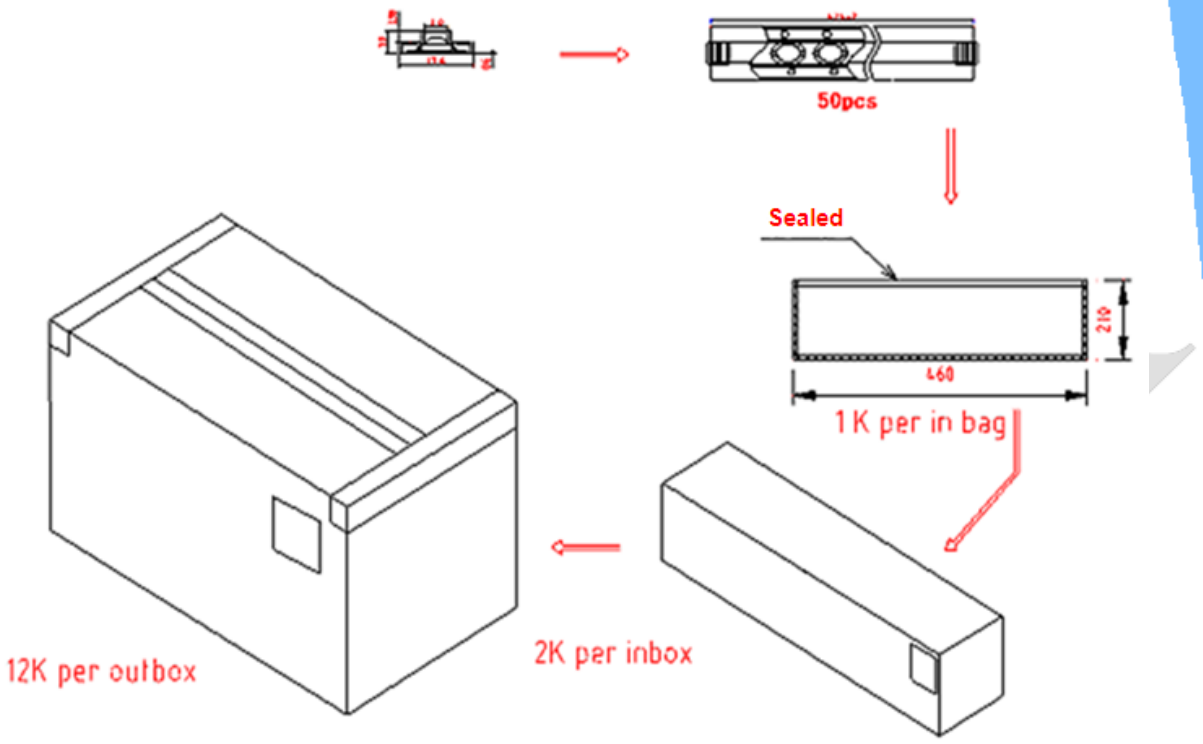
Packaging specifications 1



NOTES:

Reeled products (numbers of products are500pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, Two moisture-proof bag of maximums (total maximum number of products are 1,000pcs) packed in an inside box (size: about 350mm x about 350mm x about 60mm) and five inside boxes of maximums are put in the outside box (size: about 375mm x about 360mm x about 360mm) 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.) .

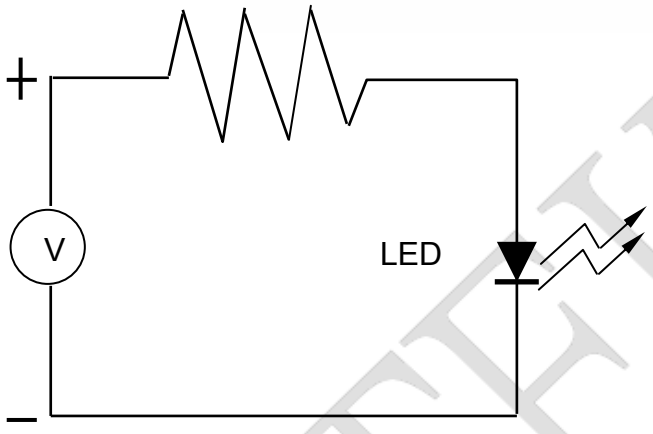
*Package available: Reel/Tube

*Tube package is the first choose if no specify

SPECIFICATION FOR APPROVAL

Test circuit and handling precautions

➢ Test circuit



➢ Handling 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: 60% R.H. Max.

   Temperature : 5℃~30℃(41℉~86℉)

   2.2 Shelf life in sealed bag: 12 month at ＜5℃~30℃ 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℃ x 24hrs and ＜5%RH, taped reel type

   3.2 100±3℃ x 2hrs , bulk type

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SMT Collets

1、Abnormal situation caused by improper setting of collet

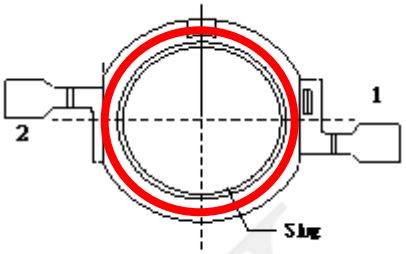
To choose the right collet is the key issue in improving the product's quality. LED is different from other electronic components, which is not only about electrical output but also for optical output. This characteristic made LED more fragile in the process of SMT. If the collet's lowering down height 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

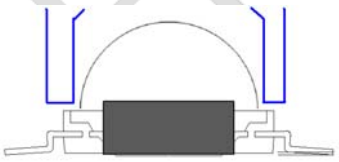
2、How to choose the collet

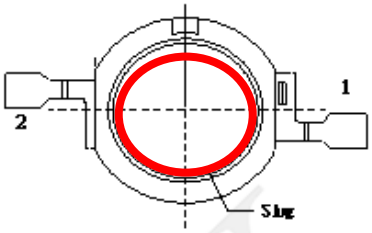
During SMT, please choose the collet that has larger outer diameter than the lighting area of lens, in case that improper position of collet will damage the gold wire inside the LED. Different collets fit for different products, please refer to the following pictures cross out:.

Outer diameter of collet should be larger than the lighting area

Outer diameter of collet





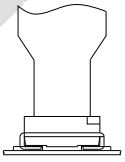


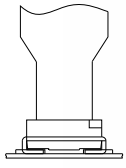
Picture 1（√）

Picture 2（×）

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 collect 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 belowed.





Picture 3（√）

Picture 4（×）

4、Other points for attention

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

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

C. 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.

D. This usage and handling instruction is only for your reference.