

# 1W HI-POWER LED SPECIFICATION

HPB8-49KxWx

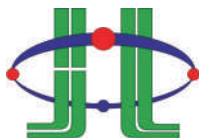


Drawn by	Checked by	Approved by



DATE:2010/4/29

REV:F



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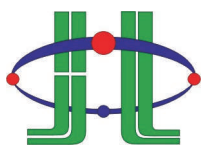
HUEY JANN High Power 1W LED is made of GaInN chips with precise package technique which makes excellent heat dissipation to reach the advantages of high luminous efficiency, low decay, and long endurance. Now we have these colors available: red, green, blue, white, yellow and infrared.

☰ **FEATERUS**

- Instant light
- Long operating life
- Superior ESD defense
- Low voltage DC operated
- More energy efficient than incandescent and most halogen lamps

☰ **TYPICAL APPLICATIONS**

- Architectural detail lighting
- Portable flashlight
- Medical applications
- Beacon lights
- Decoration lights
- Spotlight



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Explanation of Part Number:

H P B 8 - 4 9K x xWx / WPCB  
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

1.H: Huey Jann

2.P: High power LED Type

3.Shape distinguish:

B: Lambertian type      S: Side emitting type  
D: Focusing type      E: Focusing type  
R: Reflector type

4.Identification no:

5.Appearance:

1:White Diffusion  
4:Water Clear

6.Color number:

3K: Green      4K: Yellow  
5K: Red      8K: Blue  
9K: White

7.Power type:

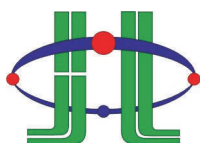
Non: 1W      05: 0.5W  
3: 3W      5: 5W

8. Color kind:

W: Pure White      YW: Warm White  
WD: Pure White      YWD: Warm White  
WG: Pure White      YWG: Warm White  
WGA: Pure White      YWGA: Warm White  
YW(4000°K): Nature White  
YWD(4000°K): Nature White  
YWG(4000°K): Nature White  
YWGA(4000°K): Nature White

9. Heat conduction type:

Non: emitter type  
/WPCB: with white star type heat sink



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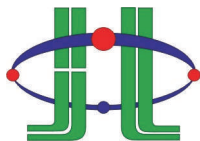
☰ **DEVICES**

Emitter Type

IF=350mA TA=25°C

Item	Lens Color	Dice Source	Color Temperature Typ (°K)	Luminous Intensity Typ (lm)
HPB8-49KW	Water Clear	GaInN/GaN	6000	60
HPB8-49KWD				90
HPB8-49KWG				105
HPB8-49KWGA				125
HPB8-49KYW(4000°K)			4000	58
HPB8-49KYWD(4000°K)				86
HPB8-49KYWG(4000°K)				100
HPB8-49KYWGA(4000°K)				119
HPB8-49KYW			3300	55
HPB8-49KYWD				81
HPB8-49KYWG				95
HPB8-49KYWGA				110

\*Tolerance: 15% HUEY-JANN measuring equipment : EXELTRON 2001. 2.S370 made by U.D.T.



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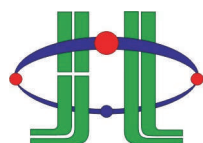
☰ **DEVICES**

With White Star MCPCB Type

IF=350mA TA=25°C

Item	Lens Color	Dice Source	Color Temperature Typ (°K)	Luminous Intensity Typ (lm)
HPB8-49KW/WPCB	Water Clear	GaInN/GaN	6000	60
HPB8-49KWD/WPCB				90
HPB8-49KWG/WPCB				105
HPB8-49KWGA/WPCB				125
HPB8-49KYW/WPCB(4000°K)			4000	58
HPB8-49KYWD/WPCB(4000°K)				86
HPB8-49KYWG/WPCB(4000°K)				100
HPB8-49KYWGA/WPCB(4000°K)				119
HPB8-49KYW/WPCB			3300	55
HPB8-49KYWD/WPCB				81
HPB8-49KYWG/WPCB				95
HPB8-49KYWGA/WPCB				110

\*Tolerance: 15% HUEY-JANN measuring equipment : EXELTRON 2001. 2.S370 made by U.D.T.

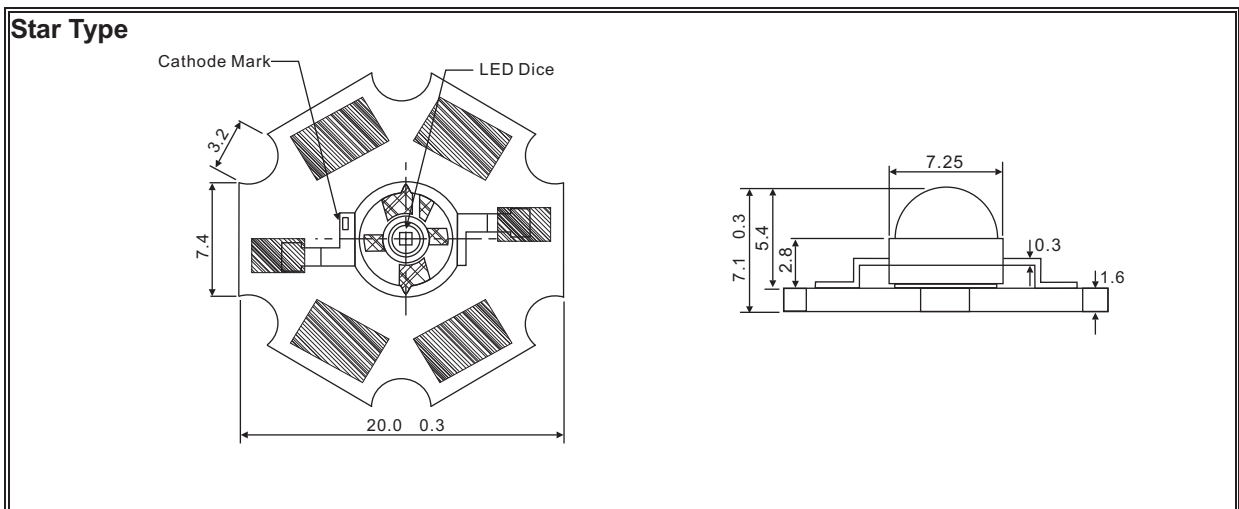
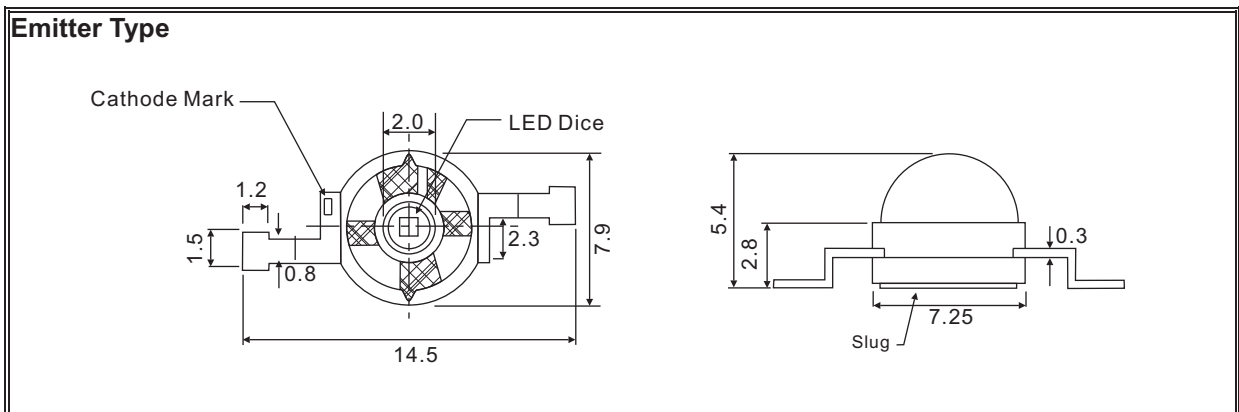


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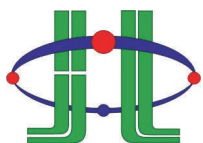
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PACKAGE DIMENSIONS:



NOTE:

- 1.All dimensions are in millimeter.
- 2.Lead spacing in measured where the lead emerge from the package.
- 3.prodruded resin under flange is 1.5mm max.
- 4.specifications are subject to change without notice.
- 5.Tolerance is 0.3mm unless otherwise noted.
- 6.Driving LED without heat sinking device is forbidden.
- 7.It is strongly recommended that the temperature of lead be not higher than 55°C.
- 8.Proper current derating must be observed to maintain junction temperature below the maximum.
- 9.LEDs are not designed to be driven in reserve bias.



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**ABSOLUTE MAXIMUM RATINGS**

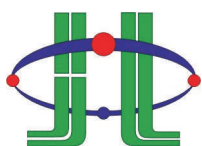
TA=25°C

PARAMETER	SYMBOL	MAX. RATING	UNIT
Continuous Forward Current	IF	350	mA
Peak Forward Current *1	IFM	500	mA
Electrostatic Discharge(HBM)	ESD	4000	V
LED Junction Temperature	Tj	135	°C
Operating Temperature	Topr	-40 ~ +110	°C
Storage Temperature	Tstg	-40 ~ +120	°C
Manual Soldering Temperature 260 °C for 5 seconds max. *2 *3			

\*1.Duty Ratio=0.1%,Pulse Width=10us.

\*2.Iron soldering high temperature will not cause damage to the dice. But be aware of the high temperature will not only make the epoxy soften but also cause the lead moving and the gold wire broken and even open. So before returning to the normal temperatures PLEASE AVOID any serious pressure on the top of epoxy and lead.

\*3.Measured at leads, lens temperature must not exceed 120°C during lead soldering and slug attach. Soldering by general IR reflow, Vapor phase reflow and wave soldering on this system product is unsuitable. Selective heating of the leads limit lead soldering, such as by hot bar reflow, fiber focussed IR, or hand soldering. The package back plane (slug) may not be attached by soldering, but rather with a thermally conductive adhesive. Electrical insulation between the slug and the board is necessary. Please consult welding matters needing attention.



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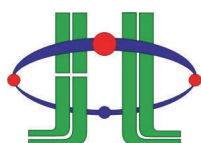
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ELECTRIC-OPTICAL CHARACTERISTICS

TA=25°C

PARAMETER	SYMBOL	TEST CONDITION	TYP	MAX	UNIT
View Angle of Half Power	2θ <sub>1/2</sub>	IF=350mA	120		deg
Forward Voltage For <b>HPB8-49KxWx</b>	VF		3.6	4.2	V
Forward Voltage For <b>HPB8-49KxWDx</b>	VF		3.5	4.0	V
Forward Voltage For <b>HPB8-49KxWGx</b>	VF		3.5	4.0	V
Forward Voltage For <b>HPB8-49KxWGAx</b>	VF		3.6	4.2	V
Color Rendering Index For <b>4000°K</b>	CRI			75	
Color Rendering Index For <b>3300°K</b>	CRI			70	
Thermal Resistance Junction To Case	R <sub>θ J-C</sub>		15		°C/W
Thermal Resistance Junction To Case With Star Type Heat Sink	R <sub>θ J-C</sub>		20		°C/W
Temperature Coefficient Of Forward Voltage	ΔV <sub>F</sub> /ΔT		-2		mV/°C



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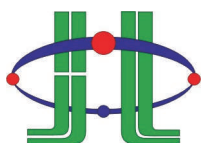
RELIABILITY TEST

Endurance Test

Test Item	Reference Standard	Test Conditions	Result
Operation Life	MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1	Connect with a power if=350mA Ta=Under room temperature Test Time=1,000hrs	0/22
High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	Ta=+85°C 5°C RH=80% ~ 85% Test Time=1,000hrs	0/22
High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High Ta=+120°C 5°C Test Time=1,000hrs	0/22
Low Temperature Storage	JIS-C-7021 :B-12	Low Ta=-40°C 5°C Test Time=1,000hrs	0/22

\*Failure Criteria:

1. VF arise  $\geq$  10%
2. IV decline  $\geq$  30%
3. A failure is an LED that is open or shorted



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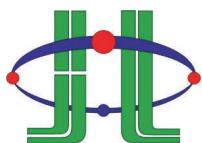
RELIABILITY TEST

➤ Environmental Test

Test Item	Reference Standard	Test Conditions	Result
Temperature Cycling	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4	-40°C ~ +25°C ~ +85°C ~ +25°C 60min 20min 60min 20min Test Time=200cycle	0/22
Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010	-40°C 5°C ~ +110°C 5°C 20min 20min Test Time=200cycle	0/22

\*Failure Criteria:

1. VF arise  $\geq$  10%
2. IV decline  $\geq$  30%
3. A failure is an LED that is open or shorted

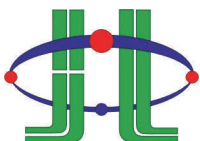
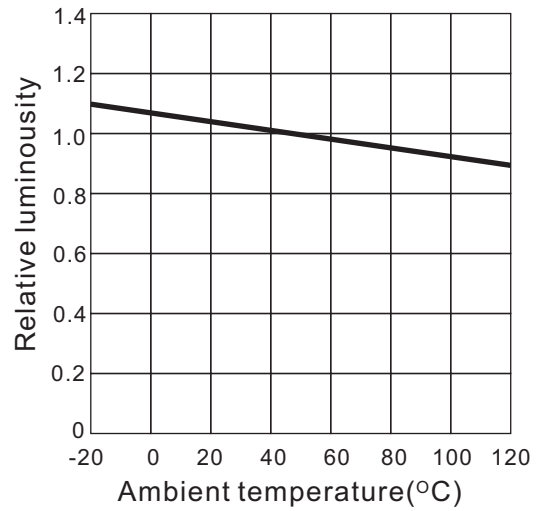
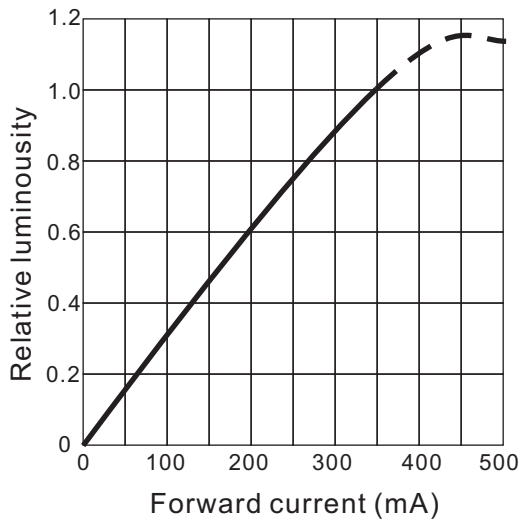
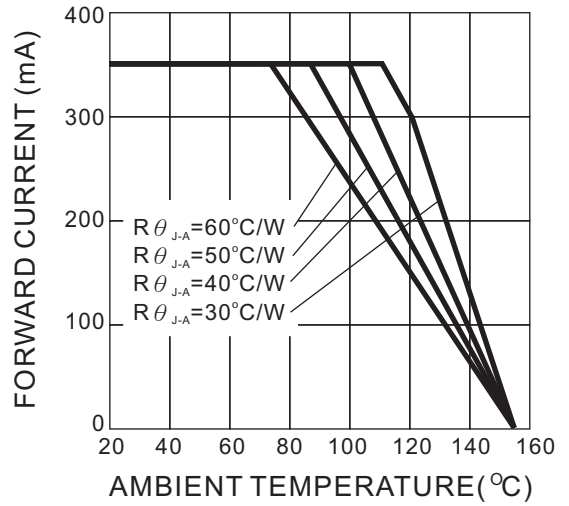
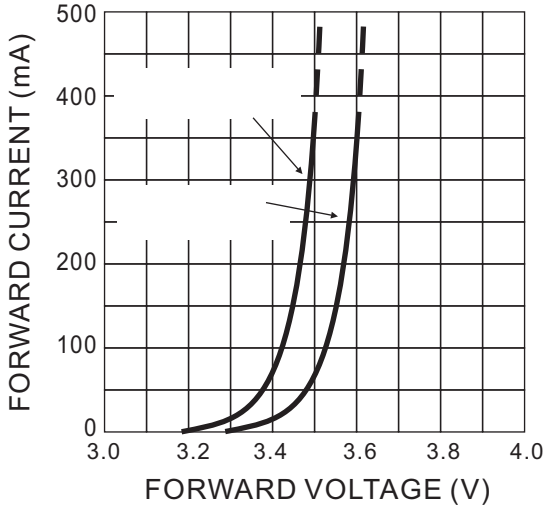


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TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES

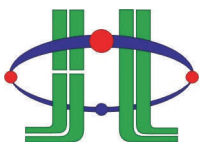
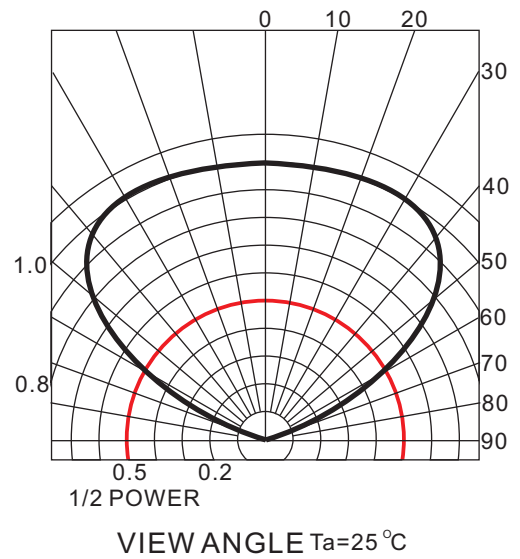
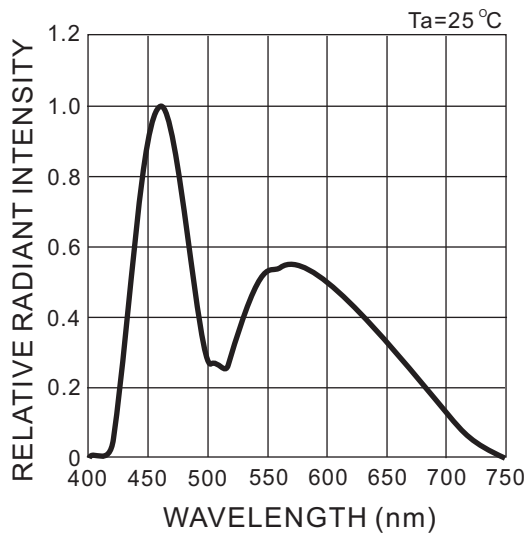
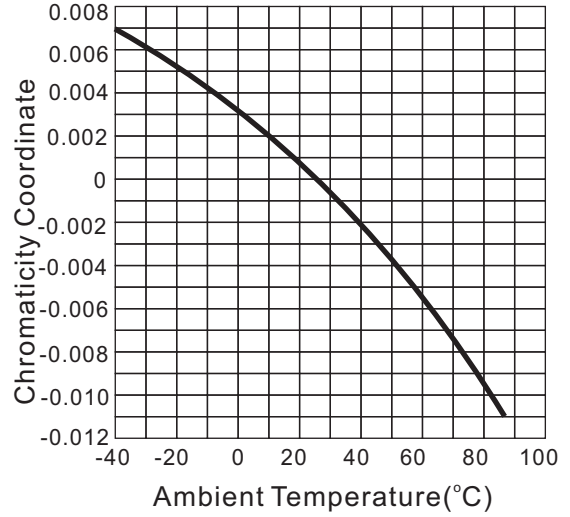
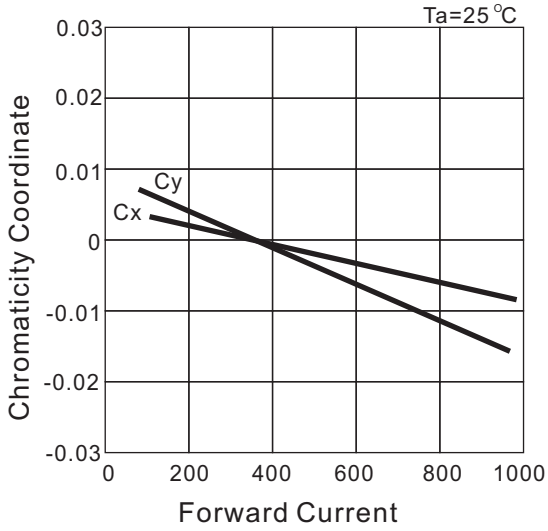


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TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES



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Brightness Bin Selection

For HPB8-49KxWx

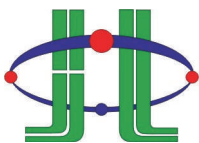
Item	Emitter Color	BIN CODE	Brightness in lm	
			Minimum	Maximum
HPB8-49KWx	Pure White	J	50	65
HPB8-49KYWx(4000°K)	Nature White	J	50	65
HPB8-49KYWx	Warm White	J	50	65

For HPB8-49KxWBx

Item	Emitter Color	BIN CODE	Brightness in lm	
			Minimum	Maximum
HPB8-49KWDx	Pure White	K	65	85
		L	85	110
HPB8-49KYWDx(4000°K)	Nature White	K	65	85
		L	85	110
HPB8-49KYWDx	Warm White	K	65	85

NOTE:

1. Test Condition at IF=350mA.
2. Brightness tolerance for each bin limit is ±15%



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Brightness Bin Selection

For HPB8-49KxWGx

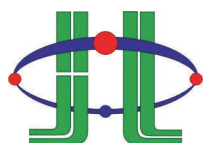
Item	Emitter Color	BIN CODE	Brightness in lm	
			Minimum	Maximum
HPB8-49KWGx	Pure White	L	85	110
		M	110	143
HPB8-49KYWGx(4000°K)	Nature White	L	85	110
HPB8-49KYWGx	Warm White	L	85	110

For HPB8-49KxWGAx

Item	Emitter Color	BIN CODE	Brightness in lm	
			Minimum	Maximum
HPB8-49KWGAx	Pure White	L	85	110
		M	110	143
HPB8-49KYWGAx(4000°K)	Nature White	L	85	110
HPB8-49KYWGAx	Warm White	L	85	110

NOTE:

1. Test Condition at IF=350mA.
2. Brightness tolerance for each bin limit is  $\pm 15\%$



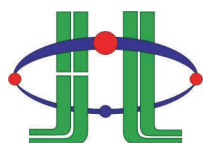
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Pure White Color Bin Selection

Bin	CCT(°K)	Chromaticity Coordinates				
	TYP					
T1	9000	x	0.274	0.292	0.299	0.283
		y	0.301	0.322	0.300	0.284
T2	9000	x	0.283	0.299	0.303	0.290
		y	0.284	0.300	0.283	0.270
T3	8000	x	0.292	0.303	0.308	0.299
		y	0.322	0.333	0.311	0.300
T4	8000	x	0.299	0.308	0.311	0.303
		y	0.300	0.311	0.293	0.283
T5	6700	x	0.301	0.314	0.316	0.305
		y	0.342	0.355	0.333	0.322
T6	6700	x	0.305	0.316	0.317	0.308
		y	0.322	0.333	0.320	0.311
T7	6700	x	0.308	0.317	0.319	0.311
		y	0.311	0.320	0.300	0.293
T8	6000	x	0.314	0.329	0.329	0.316
		y	0.355	0.369	0.345	0.333
T9	6000	x	0.316	0.329	0.329	0.317
		y	0.333	0.345	0.331	0.320
T10	6000	x	0.317	0.329	0.329	0.319
		y	0.320	0.331	0.310	0.300
T11	5300	x	0.329	0.348	0.346	0.329
		y	0.369	0.385	0.359	0.345
T12	5300	x	0.329	0.346	0.329	0.344
		y	0.345	0.359	0.331	0.344
T13	5300	x	0.344	0.329	0.343	0.329
		y	0.344	0.331	0.331	0.320
T14	4750	x	0.348	0.367	0.362	0.346
		y	0.385	0.400	0.372	0.359
T15	4750	x	0.346	0.362	0.360	0.344
		y	0.359	0.372	0.357	0.344
<b>Tolerance</b>			x ± 0.02		y ± 0.02	



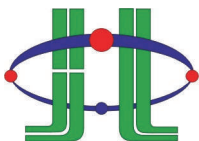
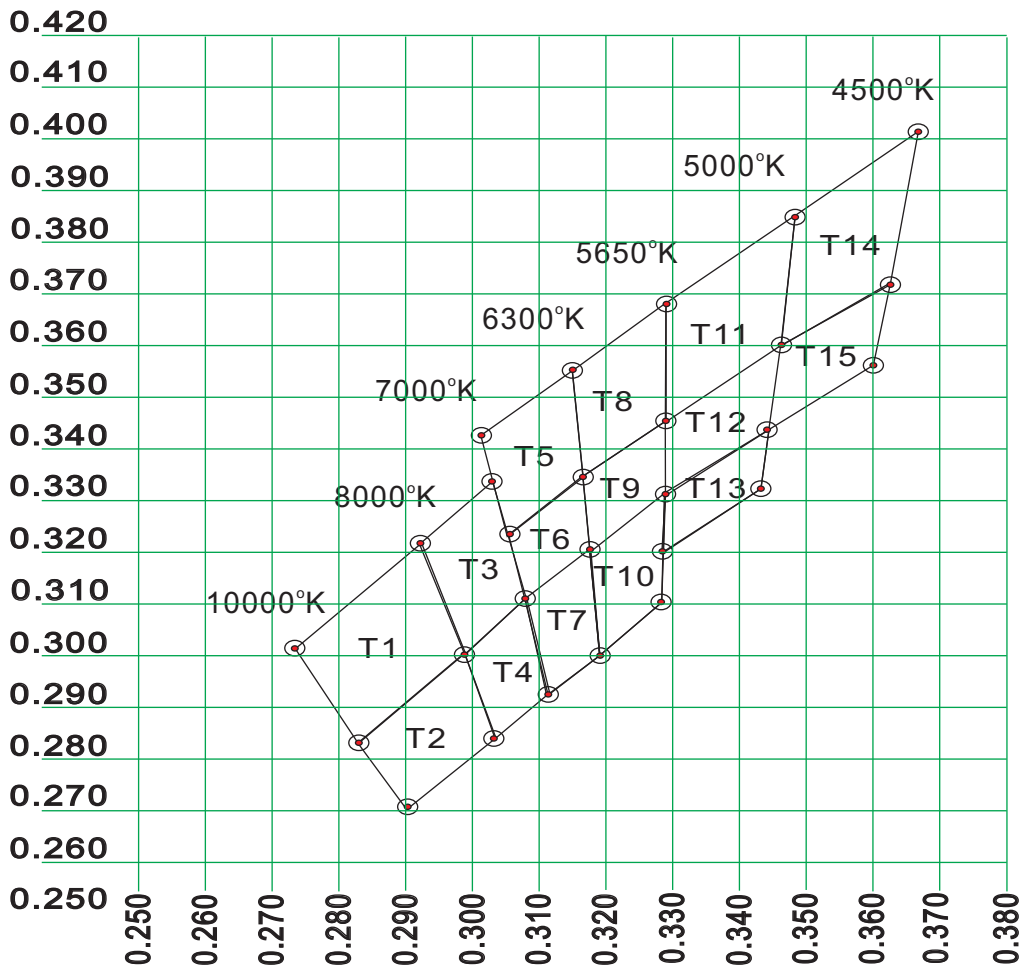
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Pure White Color Bin Selection

CIE Light Color Chart



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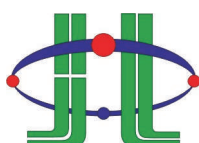
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Nature White Color Bin Selection

Bin	CCT(°K)	Chromaticity Coordinates				
	TYP					
N1	4300	x	0.367	0.385	0.381	0.364
		y	0.400	0.412	0.393	0.382
N2	4300	x	0.364	0.381	0.378	0.362
		y	0.382	0.393	0.382	0.371
N3	4300	x	0.362	0.378	0.374	0.359
		y	0.371	0.382	0.365	0.355
N4	4300	x	0.359	0.374	0.370	0.357
		y	0.355	0.365	0.351	0.342
N5	3950	x	0.385	0.402	0.396	0.381
		y	0.412	0.422	0.403	0.393
N6	3950	x	0.381	0.396	0.392	0.378
		y	0.393	0.403	0.390	0.382
N7	3950	x	0.378	0.392	0.387	0.374
		y	0.382	0.390	0.373	0.365
N8	3950	x	0.370	0.387	0.382	0.357
		y	0.351	0.373	0.359	0.342
N9	3650	x	0.402	0.420	0.414	0.396
		y	0.422	0.432	0.416	0.403
N10	3650	x	0.396	0.414	0.408	0.392
		y	0.403	0.416	0.399	0.390
N11	3650	x	0.392	0.408	0.402	0.387
		y	0.390	0.399	0.382	0.373
N12	3650	x	0.387	0.402	0.396	0.382
		y	0.373	0.382	0.367	0.359
<b>Tolerance</b>		x ± 0.02			y ± 0.02	



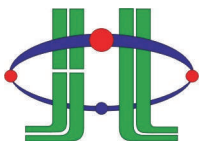
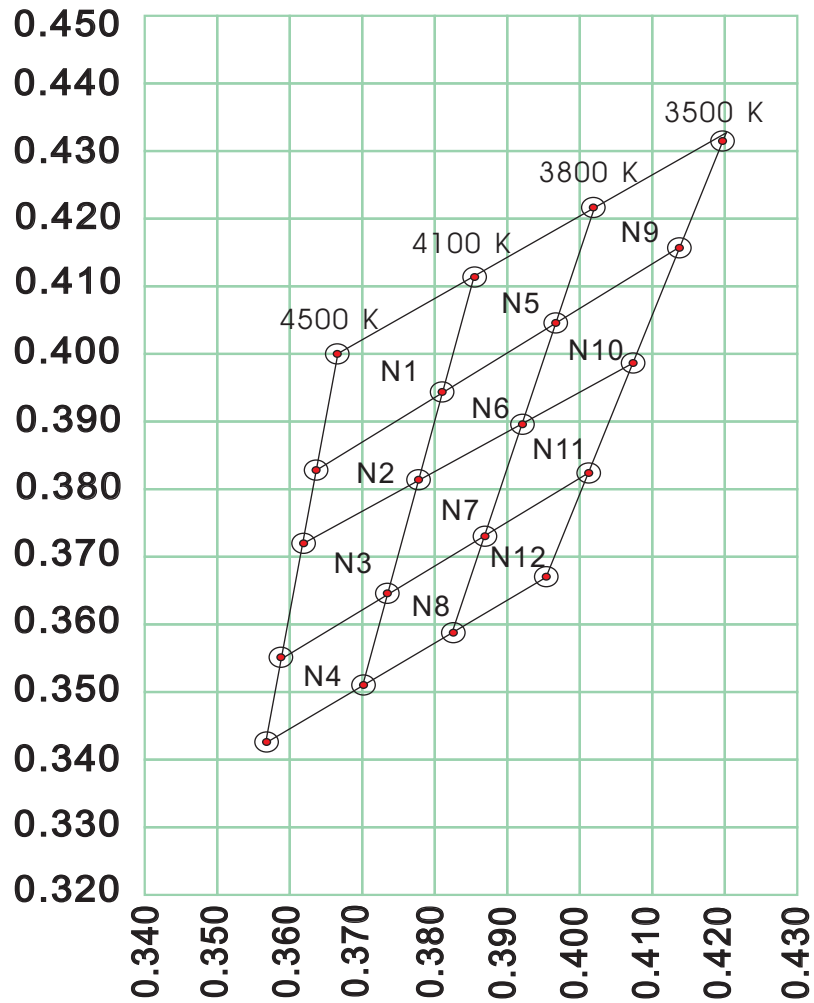
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☰ Nature White Color Bin Selection

➤ CIE Light Color Chart



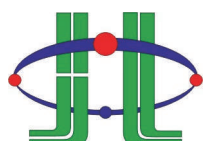
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Warm White Color Bin Selection

Bin	CCT(°K)	Chromaticity Coordinates				
	TYP					
C10	3640	x	0.402	0.417	0.409	0.392
		y	0.423	0.431	0.400	0.391
C11	3500	x	0.402	0.438	0.424	0.392
		y	0.423	0.440	0.406	0.391
C12	3640	x	0.392	0.409	0.402	0.387
		y	0.391	0.400	0.382	0.374
C13	3370	x	0.409	0.424	0.416	0.402
		y	0.400	0.406	0.389	0.382
C14	3500	x	0.387	0.416	0.410	0.383
		y	0.374	0.389	0.374	0.360
C15	3150	x	0.438	0.454	0.438	0.424
		y	0.440	0.446	0.412	0.406
C16	3150	x	0.424	0.438	0.429	0.416
		y	0.406	0.412	0.394	0.389
C17	2950	x	0.454	0.471	0.453	0.438
		y	0.446	0.451	0.416	0.412
C18	2950	x	0.438	0.453	0.444	0.429
		y	0.412	0.416	0.399	0.394
<b>Tolerance</b>			x ± 0.02		y ± 0.02	



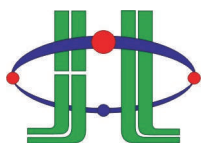
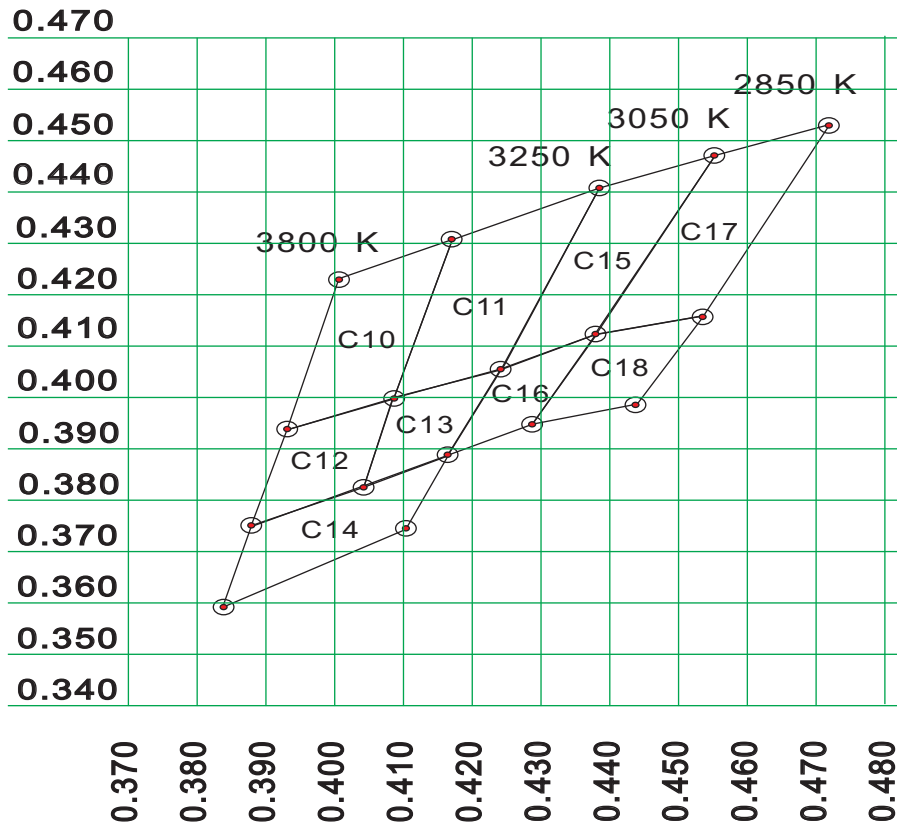
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Warm White Color Bin Selection

CIE Light Color Chart

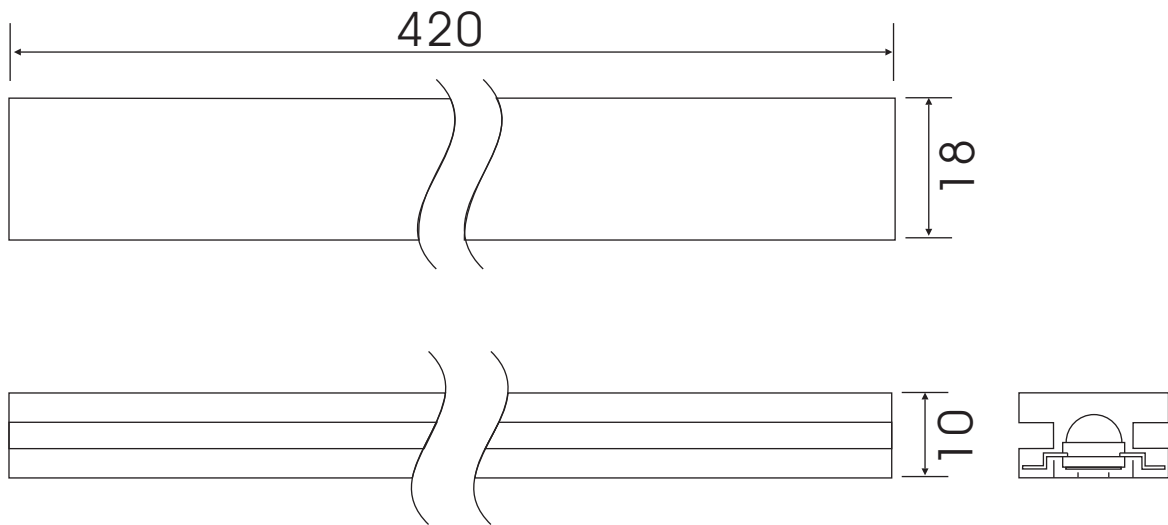


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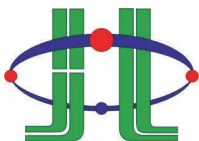
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Package Dimension For Emitter Type



NOTE:

1. Dimensions are specified as follows: mm.
2. Tolerance is 0.3mm unless otherwise noted.
3. 50 pcs emitters per tube.
4. 80 tubes per inside box.
5. 4 inside box per outside box.

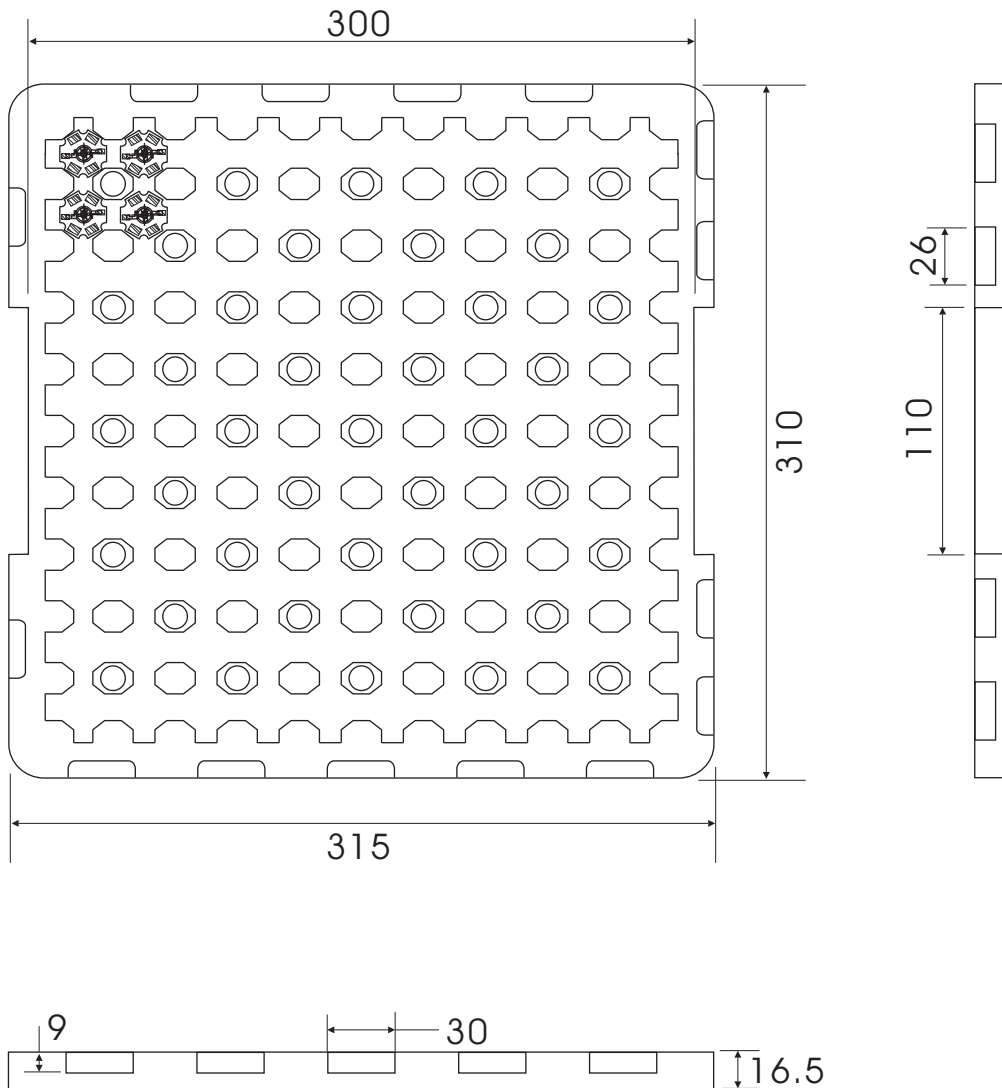


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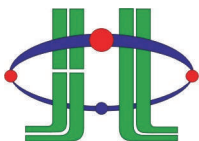
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Package Dimension For Star Type



NOTE:

1. Dimensions are specified as follows: mm.
2. Tolerance is 0.3mm unless otherwise noted.
3. 100pcs star per tray.
4. 10 trays per box.



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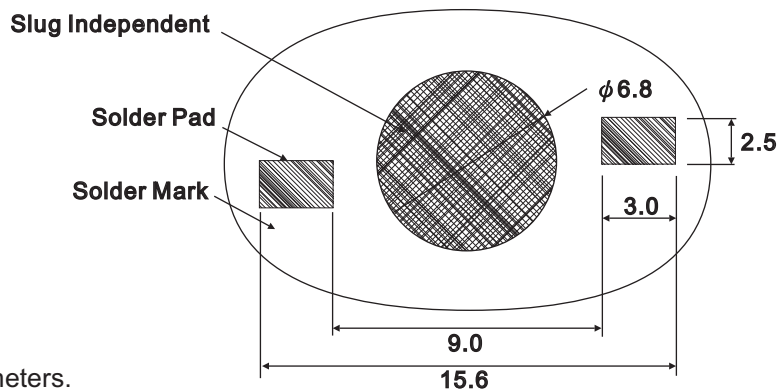
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### Requirements to user For Emitter Type

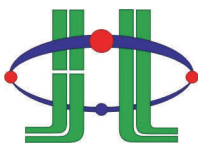
The LED products by HUEY-JANN is designed, manufactured, and sold aiming at high standard quality and reliability, however, reliability of electronic apparatus is seen as a product of reliability superior to HUEY-JANN and using status at users. From this point, HUEY-JANN requests user's for following things.

### Recommended Solder Pad Design For Emitter Type



Note:

- 1.All dimensions are in millimeters.
- 2.Electrical isolation is required between Slug and Solder Pad.



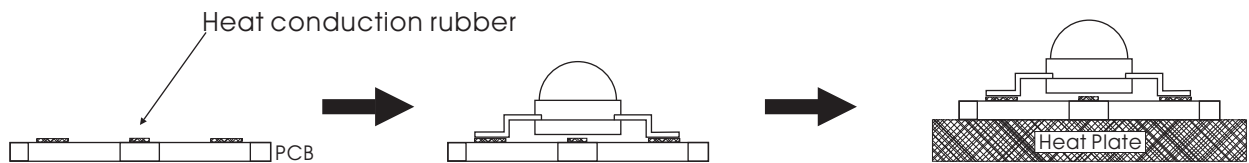
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**Heat Plate Soldering Condition For Emitter Type**

**a. Soldering Process for Solder Paste**



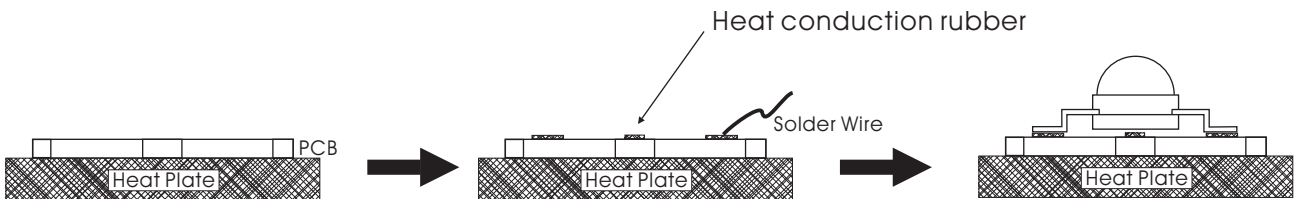
Use Solder Mask to print Solder Paste on PCB.

Place Emitter on PCB.

Put PCB on Heat Plate until Solder Paste melt.

- 1.The Solder Paste should be melted within 10 seconds.
- 2.Take out PCB out from Heat Plate within 15 seconds.

**b. Soldering Process for Solder Wire**



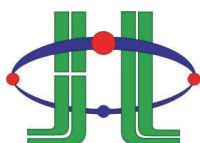
Put PCB on Heat Plate.

Place Solder Wire to the solder pad of PCB.

Put Emitter on PCB. Take the PCB out from Heat Plate within 10 seconds.

**NOTE:**

- 1.Heat plate temperature: 230°C max for Lead Solder and 260°C max for Lead-Free Solder.
- 2.When soldering, do not put stress on the LEDs during heating.
- 3.After soldering, do not warp the circuit board.



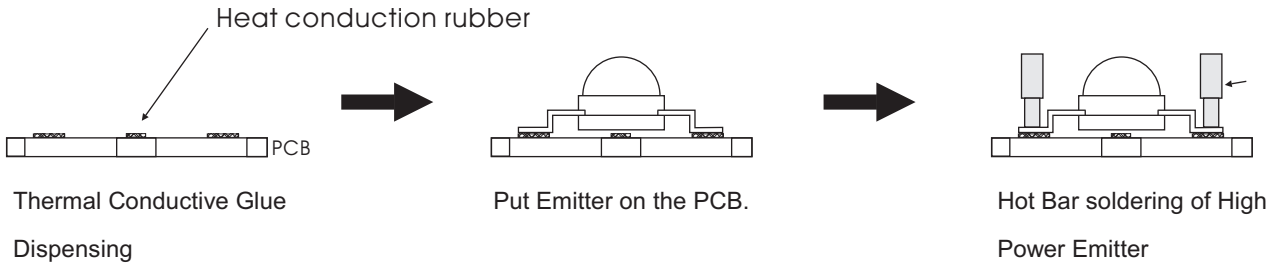
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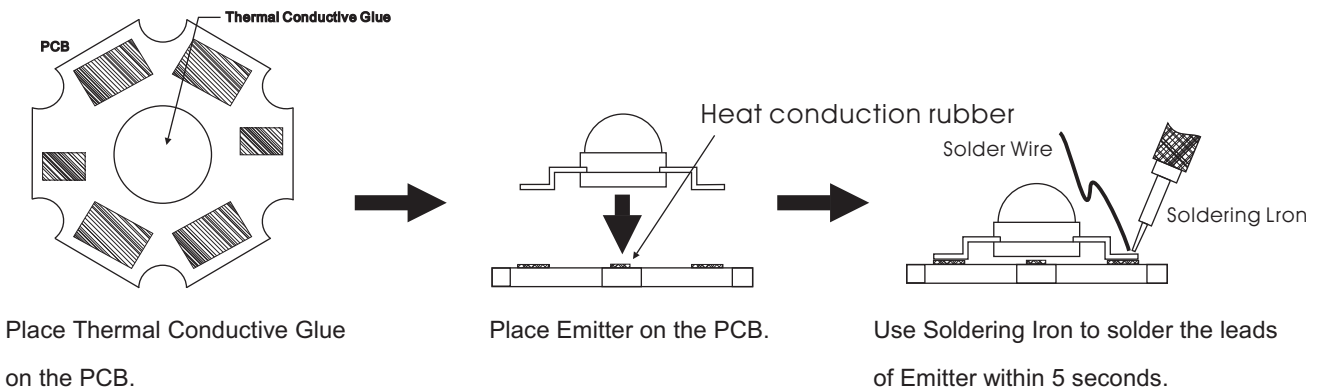
**Soldering Process For Hot Bar For Emitter Type**



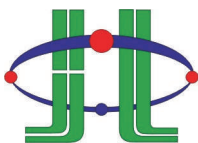
**NOTE:**

- 1.Hot Bar temperature: 230°C max for Lead Solder and 260°C max for Lead-Free Solder.
- 2.When soldering, do not put stress on the LEDs during heating.
- 3.After soldering, do not warp the circuit board.

**Manual Hand Soldering For Emitter Type**



- 1.Solder tip temperature: 230°C max for Lead Solder and 260°C max for Lead-Free Solder.
- 2.Avoiding damage to the emitter or to the PCB dielectric layer. Damage to the epoxy layer can cause
- 3.Do not let the solder contact from solder pad to back-side of PCB. This one will cause a short circuit and damage emitter.



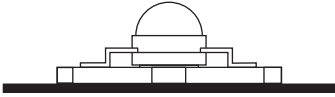
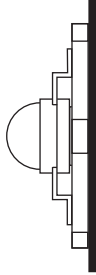
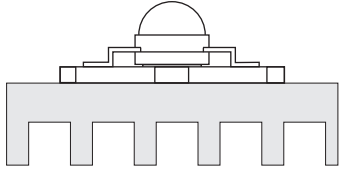
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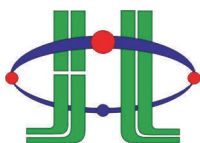
**Conclusion**

Huey Jann provide simple comparison table for High Power LED, you could find your request heat dissipation area from the following table.

	 <p>Free Convection Horizontal Flat Heat Dissipation-Set-up ( Area Require mm<sup>2</sup>)</p>	 <p>Free Convection Vertical Flat Heat Dissipation-Set-up ( Area Require mm<sup>2</sup>)</p>	 <p>Free Convection Finned Heat Dissipation-Set-up ( Area Require mm<sup>2</sup>)</p>
1W	1,800	1,500	2,400

\*TAB in this table is according to highest operating temperature 65°C.

\*Different materials of second heat dissipation device, the surface area of heat sink will be different. Thus, this document is for reference only.

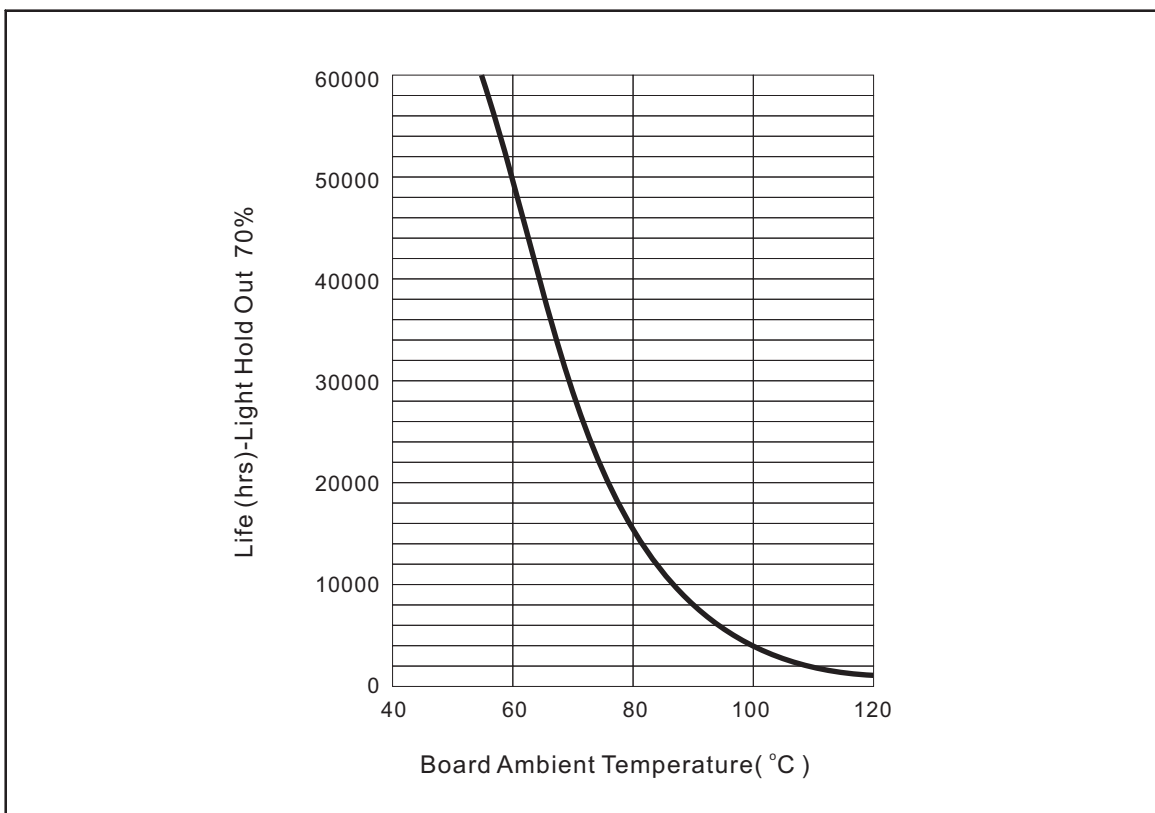
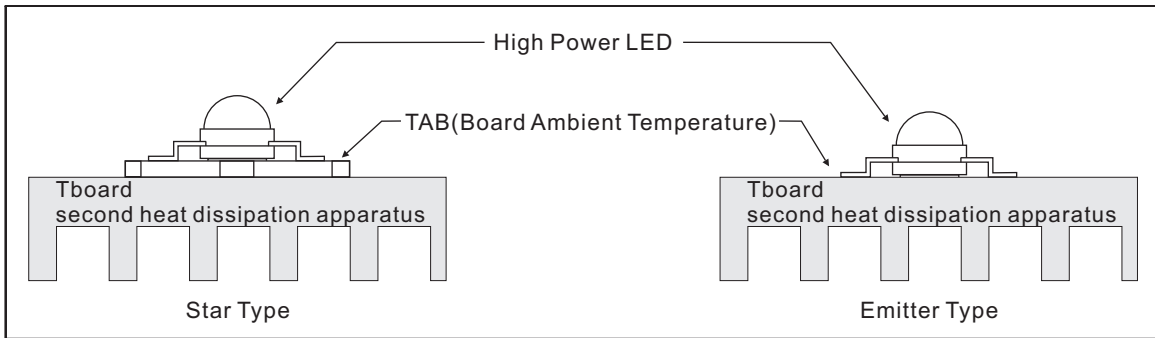


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TAB Temperature - Life Characteristics Curves

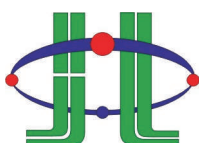


\*Board Ambient Temperature Tolerance 5°C.

\*TAB in this table is according to highest operating temperature 65°C.

\*The TAB is the stable testing value for the product lighted 100% after one hour.

\*Different materials of second heat dissipation device, the surface area of heat sink will be different. Thus, this document is for reference only.



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