

VISIBLE LIGHT PRODUCTS SPECIFICATION

HPR20D-19K20xWx



High Power 20W LED

Drawn by	Checked by	Approved by



DATE:2011/7/18

REV:F



HUEY JANN ELECTRONICS INDUSTRY CO., LTD.

No.27 Line 466 Sec.2,Cannng-nan Rd. Wu-chi Town Taichung Shien, Taiwan, R.O.C.

TEL:+886-4-26393976 FAX:+886-4-26393125

HUEY JANN High Power 20W 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 .

☰ **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
- Reading lights
- Medical applications
- Beacon lights
- Decoration lights



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Explanation of Part Number:

H P R 20 D - 1 9K 20 xWx
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

1.H: Huey Jann

2.P: High power LED Type

3.Shape distinguish:

4.Identification no:

R: Rectangular type

5.Lead frame type

6.Appearance:

1:White Diffusion

7.Color number:

8.Power type:

3K: Green

4K: Yellow

10: 10W

20: 20W

5K: Red

8K: Blue

9K: White

9.Color kind:

BWx: Cool White

Wx: Pure White

NWx: Nature White

YWx: Warm White



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DEVICES

Item	Lens Color	Dice Source	Color Temperature (°K)	
HPR20D-19K20BWG	White Diffusion	GaN/GaN	8000	Cool White
HPR20D-19K20BWGAA				
HPR20D-19K20BWGBA				
HPR20D-19K20WG			6000	Pure White
HPR20D-19K20WGAA				
HPR20D-19K20WGBA				
HPR20D-19K20NWG			4000	Nature White
HPR20D-19K20NWGAA				
HPR20D-19K20NWGBA				
HPR20D-19K20YWG			3300	Warm white
HPR20D-19K20YWGAA				
HPR20D-19K20YWGBA				



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DEVICES FOR CRI

Item	Lens Color	Dice Source	Color Temperature (°K)	
HPR20D-19K20NWG/CRI 90	White Diffusion	GalN/GaN	4000	Nature White
HPR20D-19K20NWGAA/CRI 90				
HPR20D-19K20NWGBA/CRI 90				
HPR20D-19K20YWG/CRI 90			3300	Warm white
HPR20D-19K20YWGAA/CRI 90				
HPR20D-19K20YWGGBA/CRI 90				

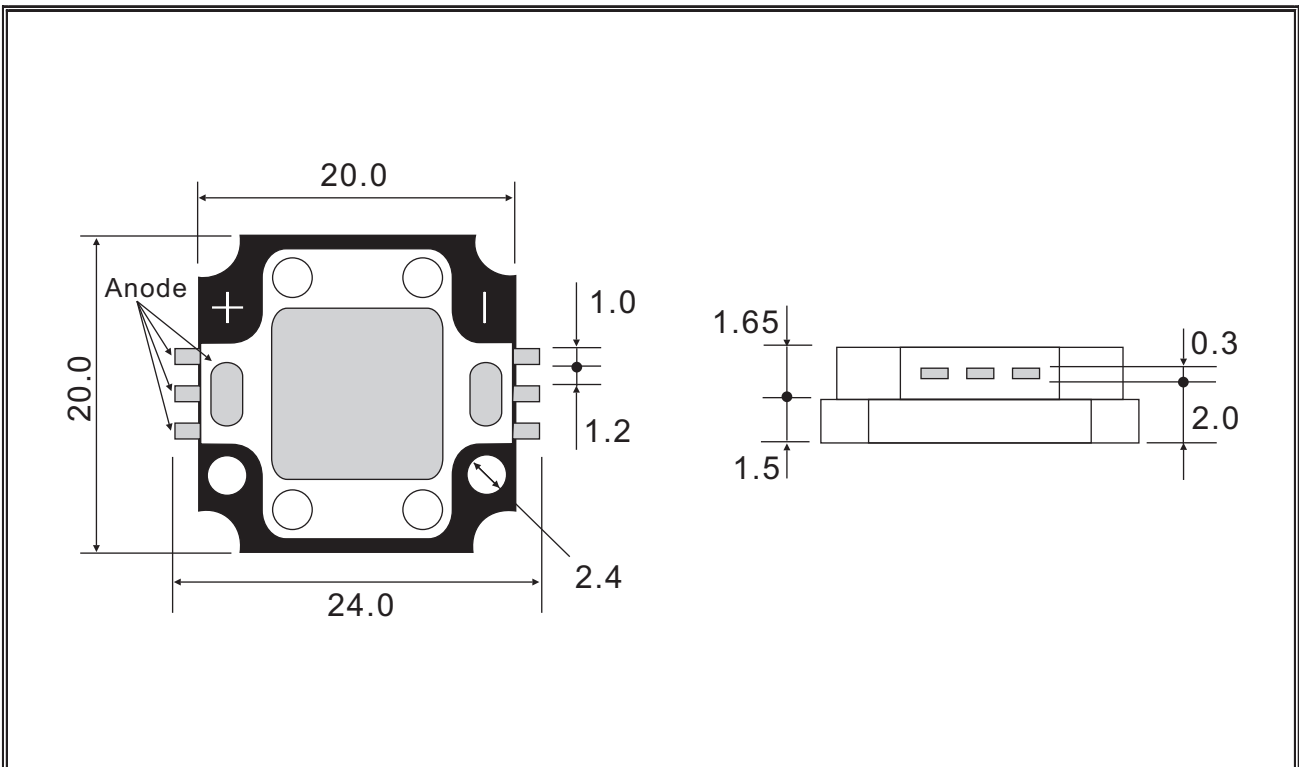


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PACKAGE DIMENSIONS:



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.
10. Warps the degree 0.5mm.



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ABSOLUTE MAXIMUM RATINGS

TA=25°C

PARAMETER	SYMBOL	MAX. RATING	UNIT
Continuous Forward Current	IF	1400	mA
Peak Forward Current *1	IFM	1500	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			

*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. We suggest using PWM (Pulse Width Modulation) for driving.

*4. It is recommended to use series as there are several 3pcs. If there are more than 5pcs, please use product with higher power.



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ELECTRIC-OPTICAL CHARACTERISTICS

TA=25°C

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
View Angle of Half Power	2θ _{1/2}	IF=1400mA		120		deg	
Forward Voltage	V _F			14	16	V	
Color Rendering Index For 4000°K	CRI			75			
Color Rendering Index For 3300°K	CRI			70			
Color Rendering Index For CRI 90	CRI			90			
Thermal Resistance Junction To Case	R _{θ J-C}				2.5		°C/W
Temperature Coefficient Of Forward Voltage	ΔV _F /ΔT				-2		mV/°C



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ELECTRIC-OPTICAL CHARACTERISTICS FOR LUMINOUS INTENSITY

TA=25°C

ITEM	SYMBOL	TEST CONDITION	MIN	TYP	UNIT
HPR20D-19K20BWG	IV	IF=1400mA		1500	lm
HPR20D-19K20BWGAA				1600	
HPR20D-19K20BWGBA				1695	
HPR20D-19K20WGW				1500	
HPR20D-19K20WGWAA				1600	
HPR20D-19K20WGWBA				1695	
HPR20D-19K20NWGW				1455	
HPR20D-19K20NWGWAA				1550	
HPR20D-19K20NWGWBA				1640	
HPR20D-19K20YWGW				1348	
HPR20D-19K20YWGWAA				1440	
HPR20D-19K20YWGWBA				1525	

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



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ELECTRIC-OPTICAL CHARACTERISTICS FOR LUMINOUS INTENSITY FOR CRI

TA=25°C

ITEM	SYMBOL	TEST CONDITION	MIN	TYP	UNIT
HPR20D-19K20NWG/CRI 90	IV	IF=1400mA		1200	lm
HPR20D-19K20NWGAA/CRI 90				1270	
HPR20D-19K20NWGBA/CRI 90				1350	
HPR20D-19K20YWG/CRI 90				1110	
HPR20D-19K20YWGAA/CRI 90				1180	
HPR20D-19K20YWGBA/CRI 90				1250	

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



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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=1400mA 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

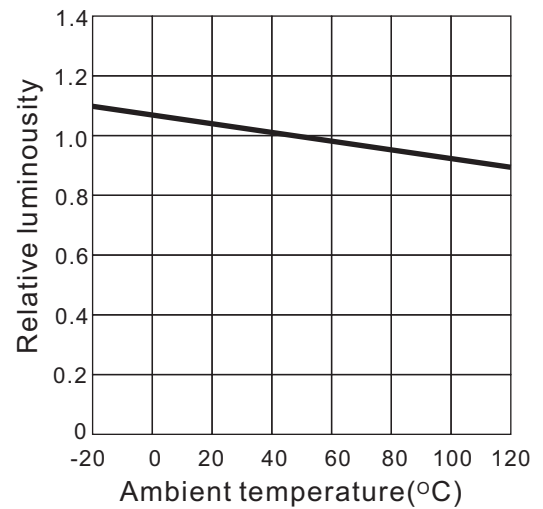
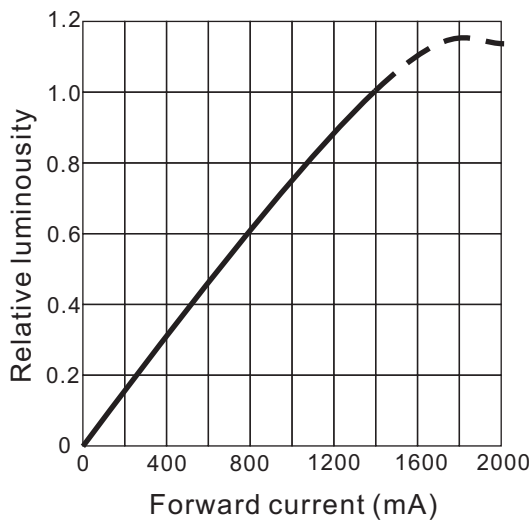
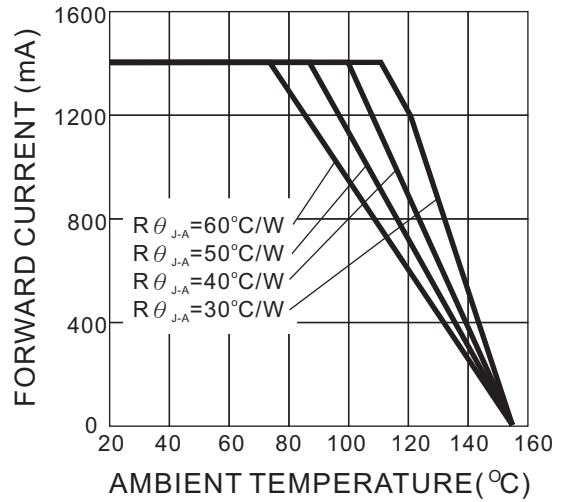
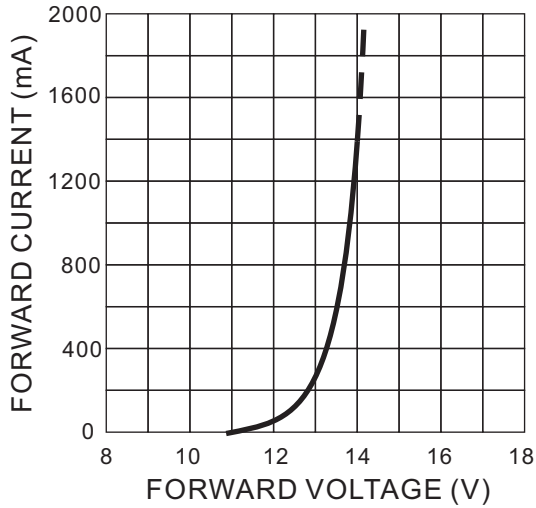


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TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES

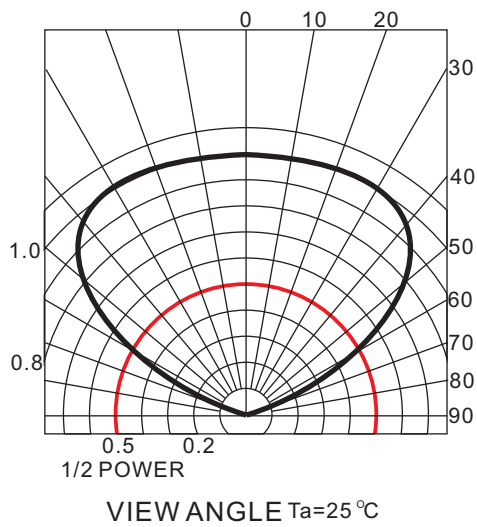
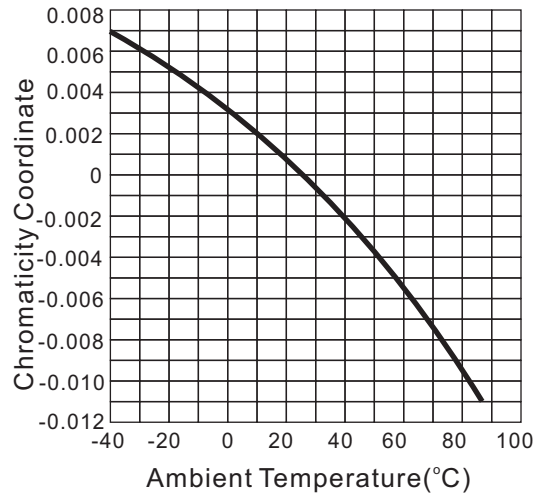
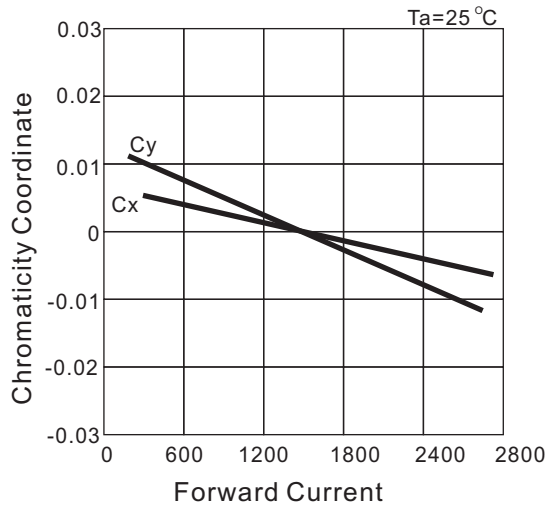


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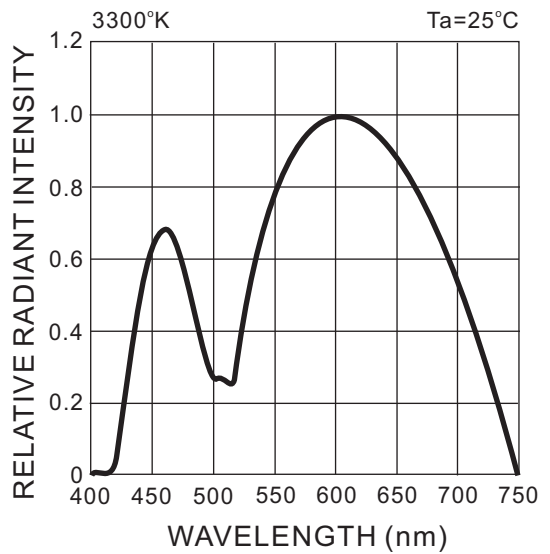
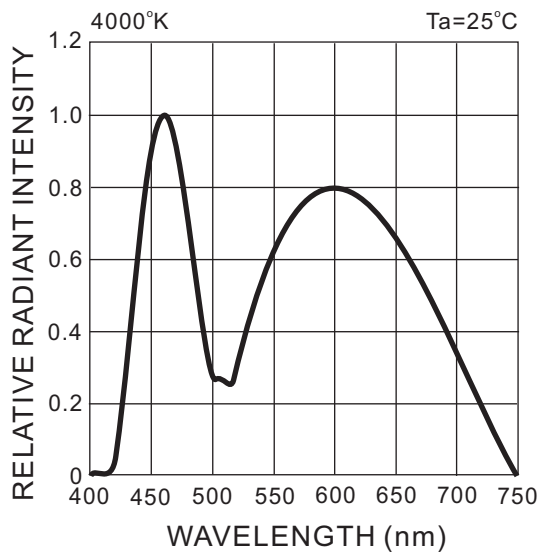
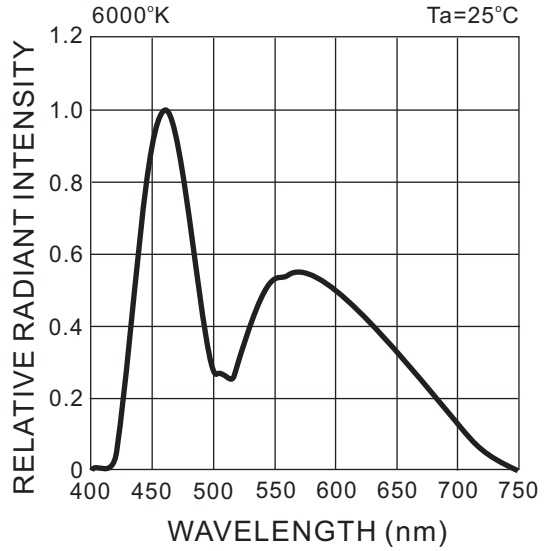
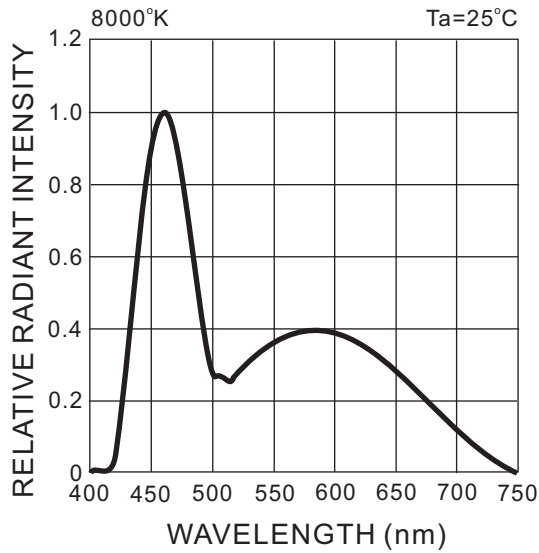


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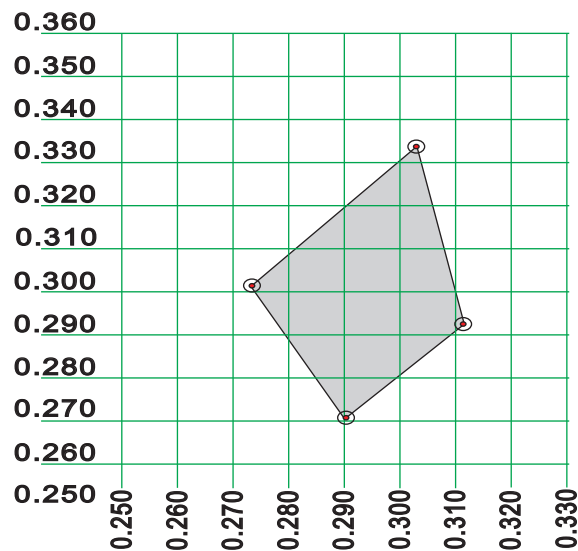
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Cool White Color Bin Selection

CCT(°K)	Chromaticity Coordinates					
TYP						
8000	x	0.274	0.303	0.311	0.290	
	y	0.301	0.333	0.293	0.270	
Tolerance		$x \pm 0.02$			$y \pm 0.02$	

Cool White CIE Light Color Chart



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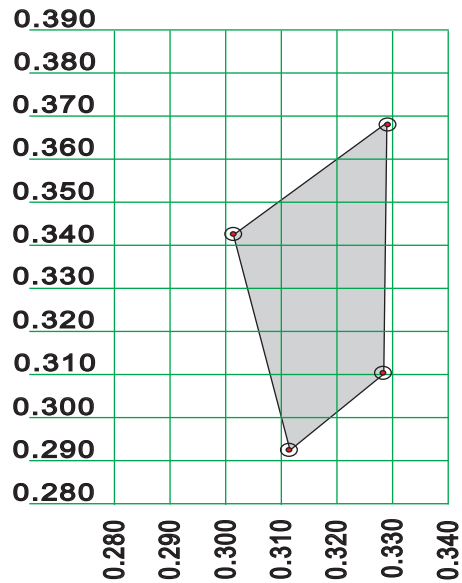
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Pure White Color Bin Selection

CCT(°K)	Chromaticity Coordinates				
TYP					
6000	x	0.301	0.329	0.329	0.311
	y	0.342	0.369	0.310	0.293
Tolerance		$x \pm 0.02$		$y \pm 0.02$	

Pure White CIE Light Color Chart



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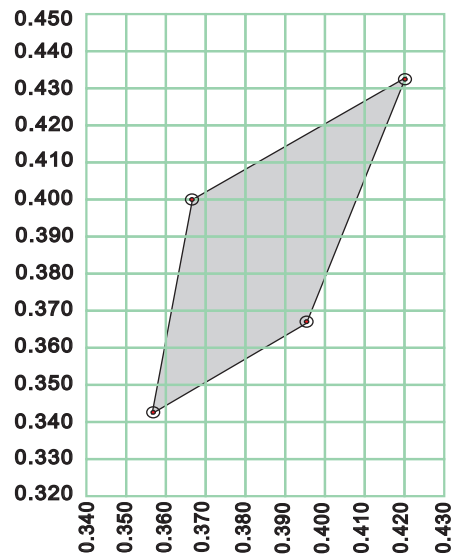
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☰ Nature White Color Bin Selection

CCT(°K)	Chromaticity Coordinates				
TYP					
4000	x	0.367	0.420	0.396	0.357
	y	0.400	0.432	0.367	0.342
Tolerance		$x \pm 0.02$		$y \pm 0.02$	

☰ Nature White CIE Light Color Chart



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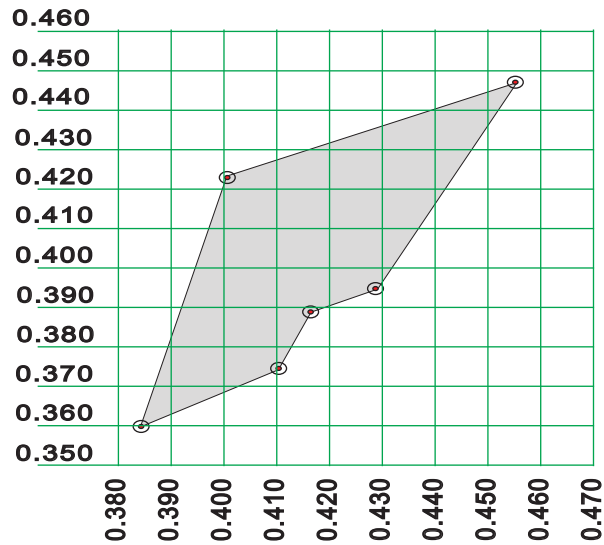
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Warm White Color Bin Selection

CCT(K)	Chromaticity Coordinates						
TYP							
3300	x	0.402	0.454	0.429	0.416	0.410	0.383
	y	0.423	0.446	0.394	0.389	0.374	0.360
Tolerance		x ± 0.02			y ± 0.02		

Warm White CIE Light Color Chart

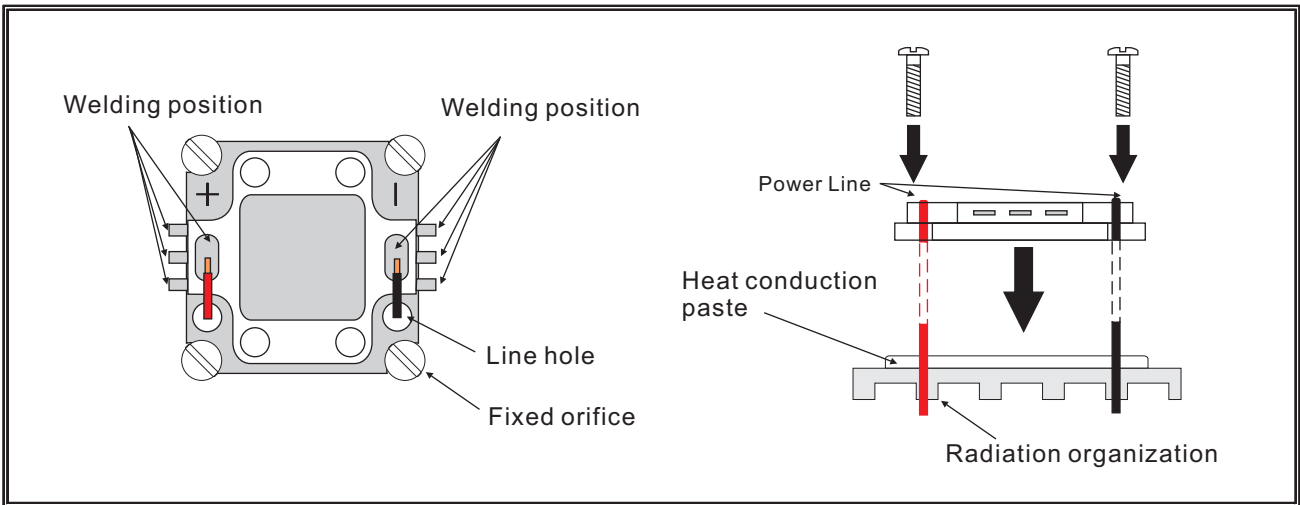


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POSITION EXPLANATION:



Conclusion

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

	Free Convection Horizontal Flat Heat Dissipation-Set-up (Area Require mm ²)	Free Convection Vertical Flat Heat Dissipation-Set-up (Area Require mm ²)	Free Convection Finned Heat Dissipation-Set-up (Area Require mm ²)
20W	24,000	18,000	82,500

*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.

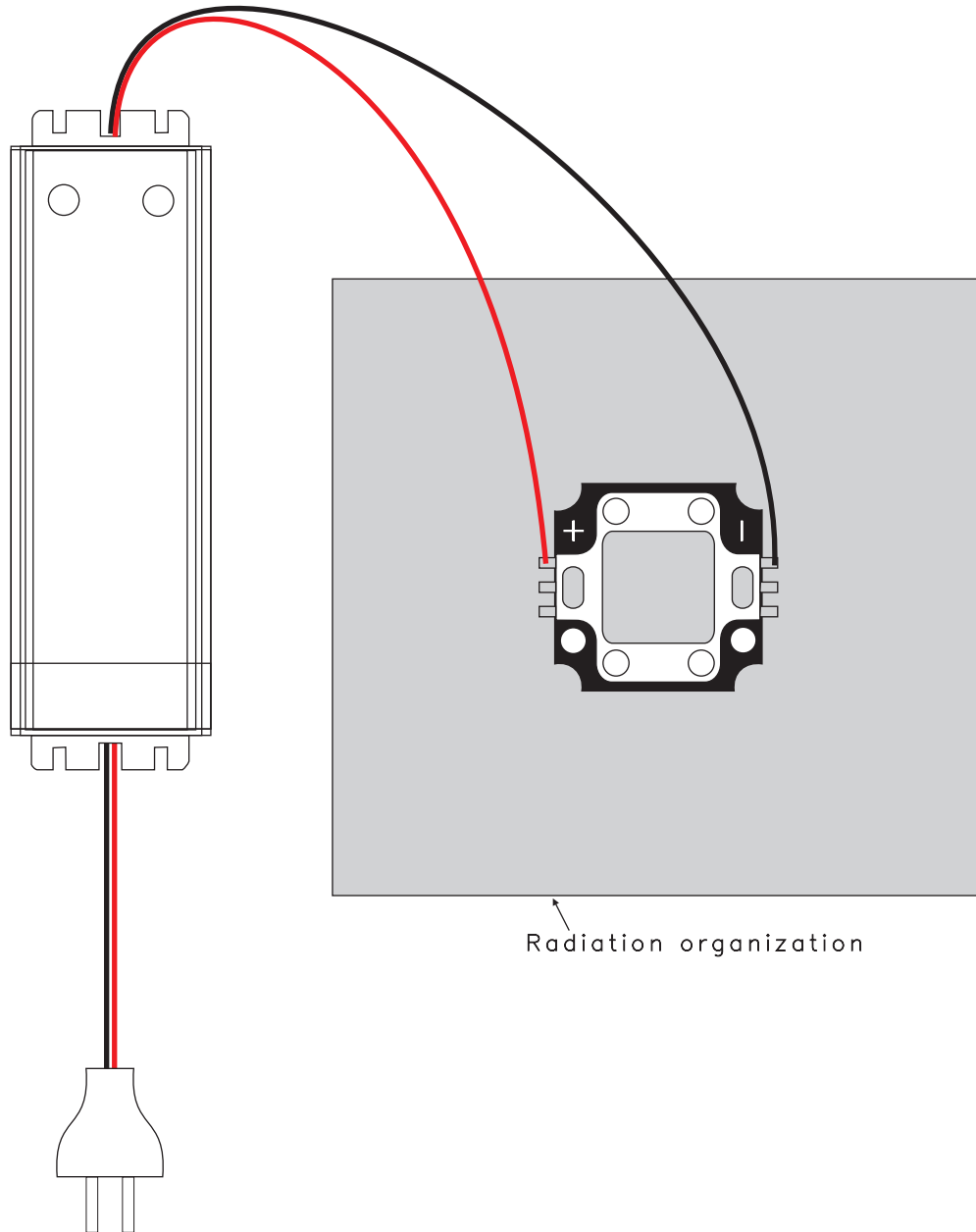


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PRODUCT APPLICATION

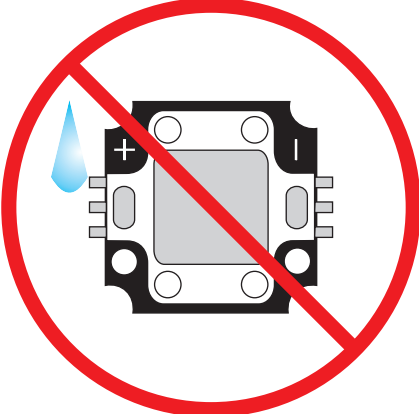


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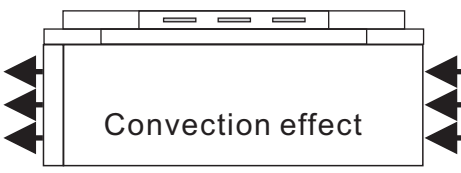
20W Operating Instructions



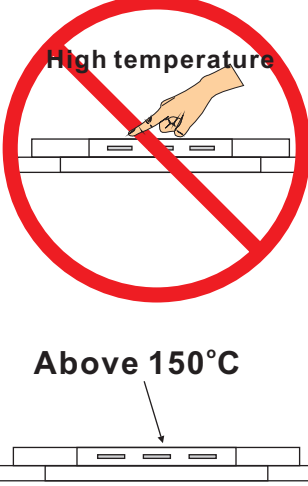
1. It is important to keep away the product from water, in order to avoid the product electronic characteristics to be harmful.



2. When making use of products, it is necessary to use anti-ESD devices to prevent destructive electronic characteristics.



3. It should be noticed whether there is convection in design of device. Convection has to exist.



4. There is 150 C directly from the front of 20W emitting diode. It is untouchable to prevent burning.

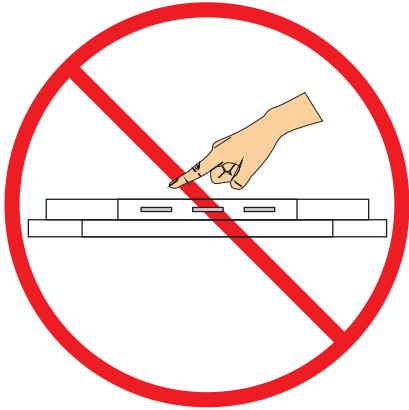


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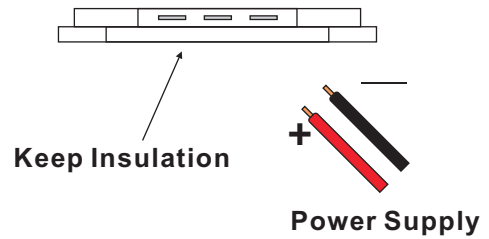
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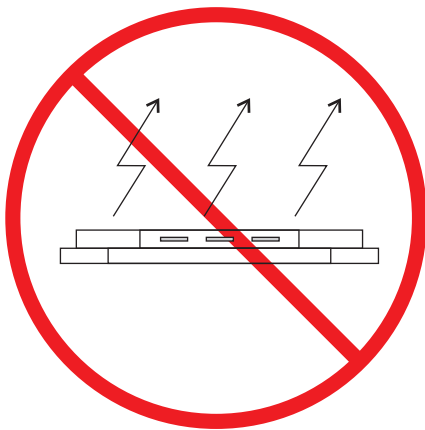
20W Operating Instructions



5. The material in the central top of 20W LED is soft. Therefore, it is un-squeezable and un-touchable.



6. In the bottom of heat sink cannot be touched with neither positive nor negative pole. (Heat sink has to be insulation.)



7. The product should not be light up directly without heat dissipation device.

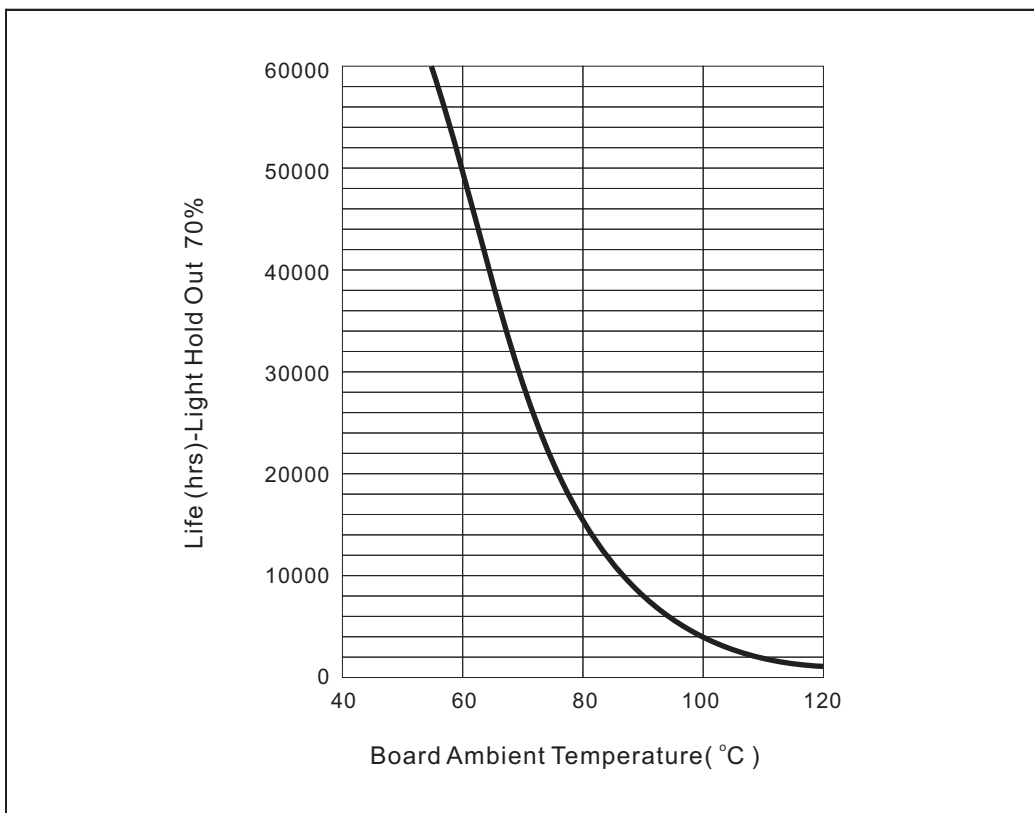
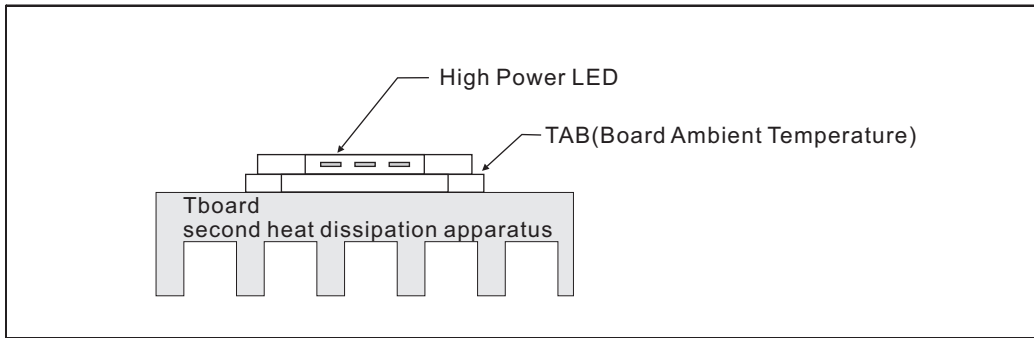


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TAB Temperature - Life Characteristics Curves



*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.

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Remarks:

1. Brightness values are measured during a current pulse of typical 25 ms, the brightness tolerance is $\pm 15\%$.
2. Chromaticity coordinates are measured during a current pulse of typical 200 ms, the chromaticity tolerance is ± 0.015 .
3. Forward voltage are measured during a current pulse of typical 5 ms, the VF tolerance is $\pm 0.15V$.
4. Dimensions are specified as follows: mm.
5. Related technical parameters of LED are average value resulted from statistic. The actual parameters of LED could be slightly different from average and characteristic curve.
6. The average value of LED will be changed by technical improvement and elevation, and subject to change without prior notice.
7. Hi-Power LED can not be operated without second heat dissipating structure.
8. Poor or damaged second heat dissipating structure could lead to defective electrical characteristic of High Power LED, CCT escalation, brightness drop, lifetime shortening or burn out. Following instructions of Huey Jann Hi-Power LED series document can avoid LED burn out and electrical defectiveness due to improper usage, and maintain normal performance of the products.



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