

HI-POWER INFRARED LED SPECIFICATION

HIRPM8-1Gx



Drawn by	Checked by	Approved by

Infrared High Power LED is made of hi-eff GaAIAs chips with precise package technique which makes excellent heat dissipation to reach the advantages of high radiant output power efficiency, low decay, and long endurance.

FEATERUS

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

TYPICAL APPLICATIONS

- Remote controller
- Monitor illumination
- Security system
- Fire control
- 3C products
- Data-transmission
- Special medical

DEVICES

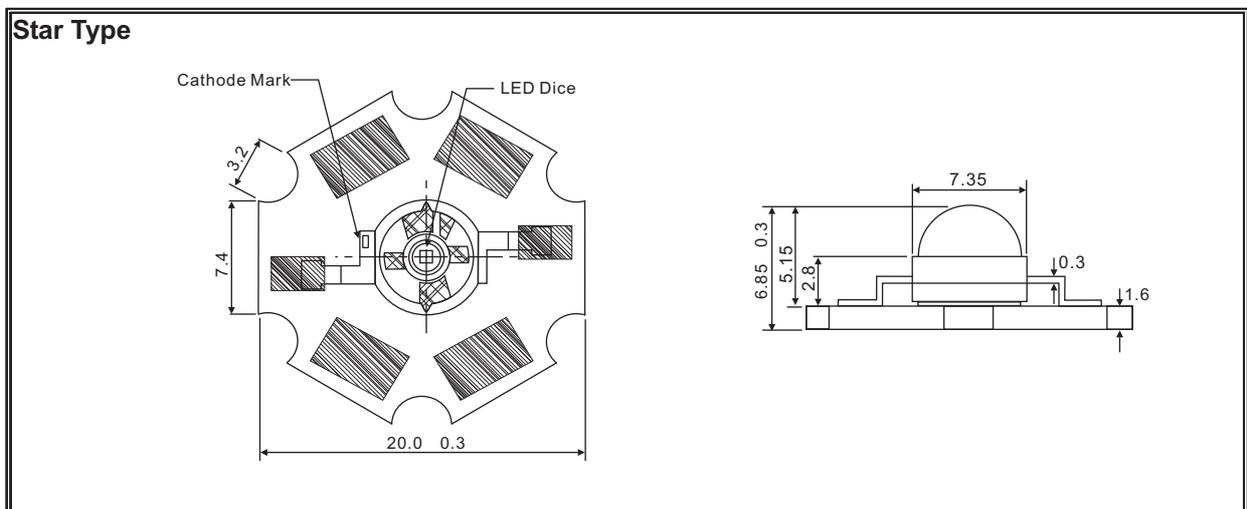
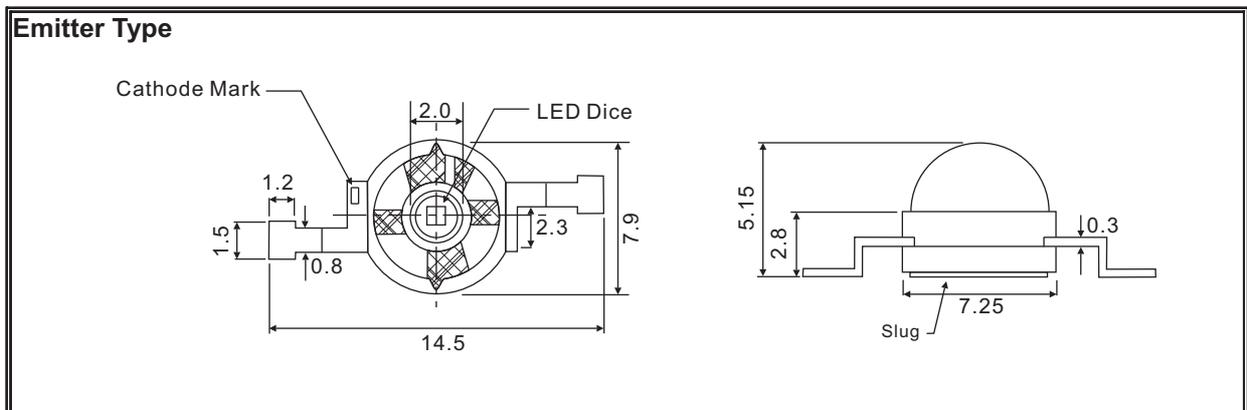
Emitter Type

Item			
HIRPM8-1G	Water Clear	GaAIAs/GaAIAs	Infrared
HIRPM8-1Gb		GaAIAs/GaAIAs	Infrared

With White Star MCPCB Type

Item			
HIRPM8-1G/WPCB	Water Clear	GaAIAs/GaAIAs	Infrared
HIRPM8-1Gb/WPCB		GaAIAs/GaAIAs	Infrared

PACKAGE DIMENSIONS:



NOTE:

- 1.All dimensions are in millimeter.
- 2.Lead spacing is measured where the lead emerges from the package.
- 3.protruded resin under flange is 1.5mm max.
- 4.specifications are subject to change without notice.
- 5.Tolerance is ± 0.3 mm 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 reverse bias.

ABSOLUTE MAXIMUM RATINGS

TA=25°C

PARAMETER		SYMBOL	MAX. RATING	UNIT
Continuous Forward Current	HIRPM8-1Gx	IF	1000	mA
	HIRPM8-1Gbx		500	
Peak Forward Current *1	HIRPM8-1Gx	IFM	1500	mA
	HIRPM8-1Gbx		1000	
Reverse Voltage		VR	5	V
LED Junction Temperature		Tj	120	°C
Operating Temperature		Topr	-40 ~ +110	°C
Storage Temperature		Tstg	-40 ~ +120	°C
Reflow Soldering (preheat 150-180°C 60-120sec, soldering temp 260°C 10sec)				

*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.

ELECTRIC-OPTICAL CHARACTERISTICS FOR HIRPM8-1Gx

TA=25°C

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
View Angle of Half Power	2θ _{1/2}	IF=1000mA		116		deg	
Forward Voltage	V _F			1.6	1.9	V	
Reverse Current	I _R	VR=5V			100	μA	
Radiant Output Power	P _o	IF=1000mA	80	154		mw/sr	
Peak Emission Wavelength	λ _p			850		nm	
Spectrum Width Of Half Valve	Δλ			40		nm	
Rise/Fall Time	Tr/Tf			25/15	35/35	ns	
Thermal Resistance Junction To Case	R _{θ J-C}				14		°C/W
Thermal Resistance Junction To Case With Star Type Heat Sink	R _{θ J-C}				18		°C/W
Temperature Coefficient Of Forward Voltage	ΔV _F /ΔT				-2		mV/°C
Terminal Capacitance	C _t	V=0V F=1MHz		40		pF	

ELECTRIC-OPTICAL CHARACTERISTICS FOR HIRPM8-1Gbx

TA=25°C

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
View Angle of Half Power	2θ _{1/2}	IF=500mA		116		deg	
Forward Voltage	V _F			1.7	2.0	V	
Reverse Current	I _R	VR=5V			100	μA	
Radiant Output Power	P _o	IF=500mA	60	113		mw/sr	
Peak Emission Wavelength	λ _p			850		nm	
Spectrum Width Of Half Valve	Δλ			40		nm	
Rise/Fall Time	T _r /T _f				25/15	35/35	ns
Thermal Resistance Junction To Case	R _{θ J-C}				15		°C/W
Thermal Resistance Junction To Case With Star Type Heat Sink	R _{θ J-C}				20		°C/W
Temperature Coefficient Of Forward Voltage	ΔV _F /ΔT				-2		mV/°C
Terminal Capacitance	C _t	V=0V F=1MHz		40		pF	

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=500~1000mA 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

RELIABILITY TEST

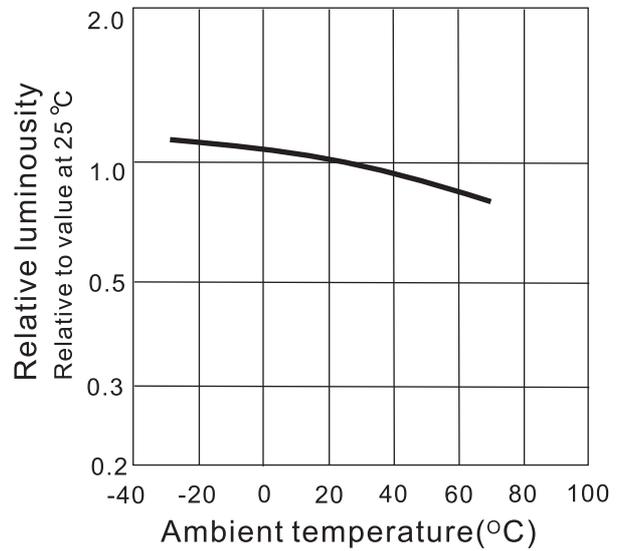
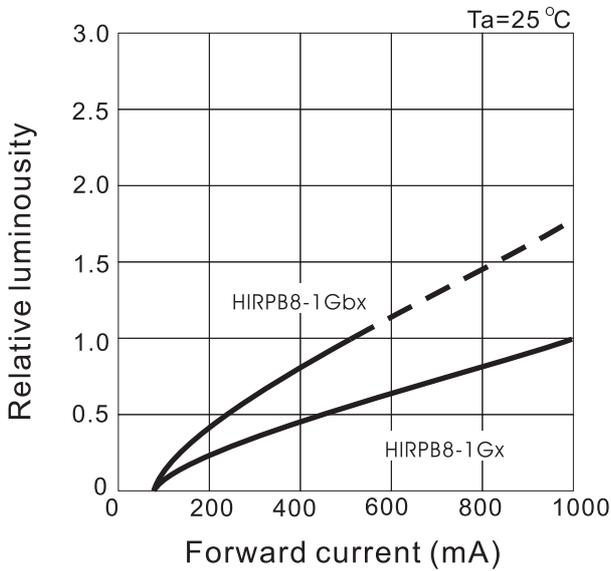
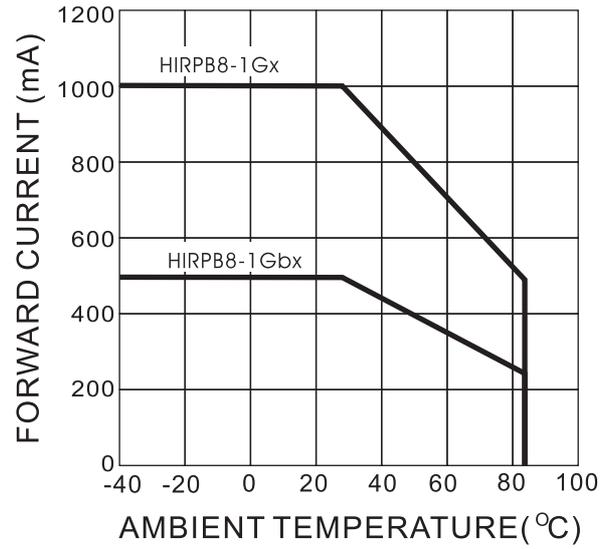
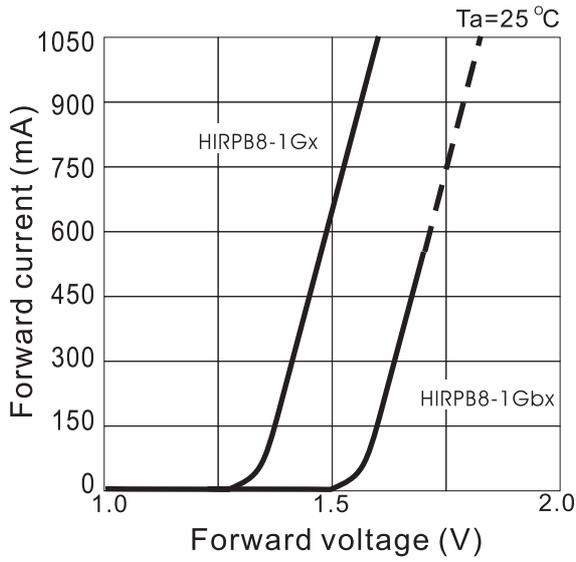
➤ Environmental Test

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

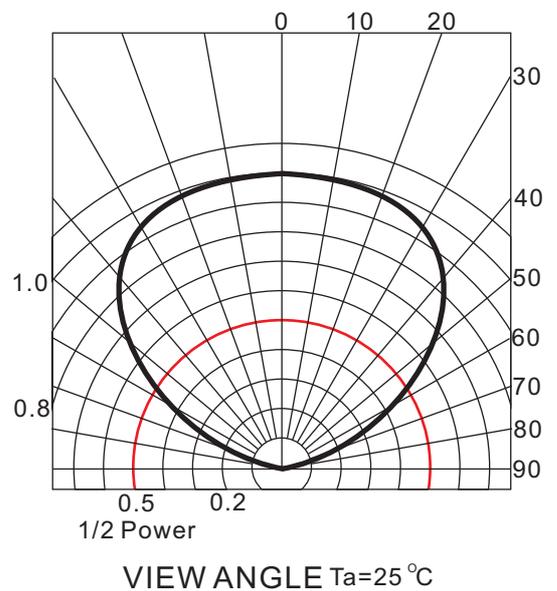
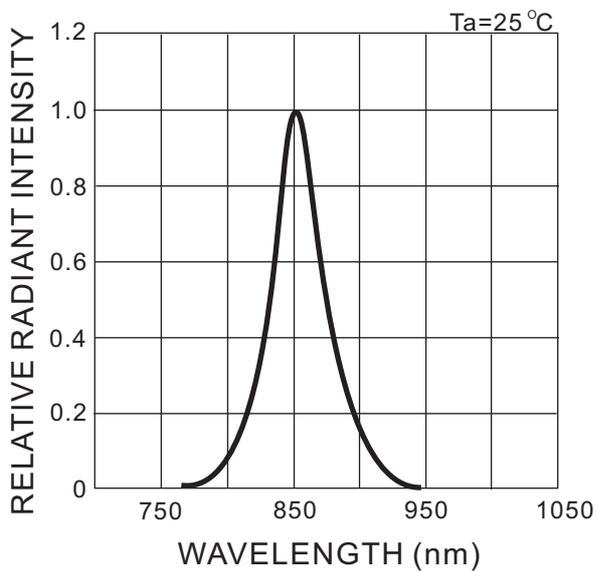
*Failure Criteria:

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

TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES



TYPICAL ELECTRICAL OPTICAL CHARACTERISTICS CURVES



LED VF Bin Selection

HIRPM8-1Gx

BIN CODE	Forward Voltage	
	Minimum	Maximum
b	1.4	1.6
c	1.6	1.8
d	1.8	2.0

HIRPM8-1Gbx

BIN CODE	Forward Voltage	
	Minimum	Maximum
b	1.4	1.6
c	1.6	1.8
d	1.8	2.0

NOTE:

1. Test Condition at $I_F=500 / 1000\text{mA}$.

Brightness Bin Selection

HIRPM8-1Gx

BIN CODE	Brightness in lm	
	Minimum	Maximum
7	80	100
8	100	140
9	140	200
10	200	280

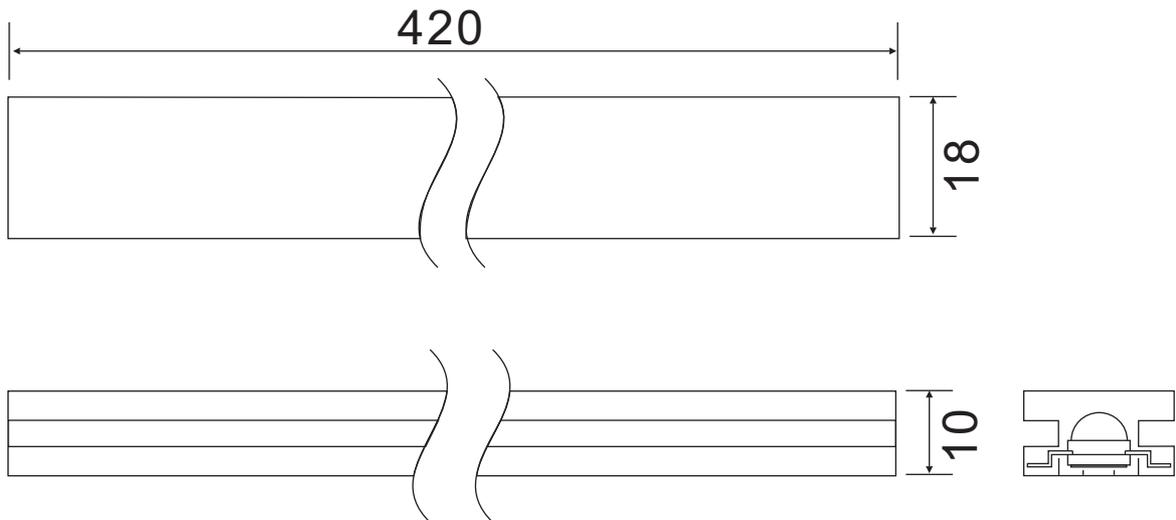
HIRPM8-1Gbx

BIN CODE	Brightness in lm	
	Minimum	Maximum
6	70	80
7	80	100
8	100	140

NOTE:

1. Test Condition at $I_F=500 / 1000\text{mA}$.

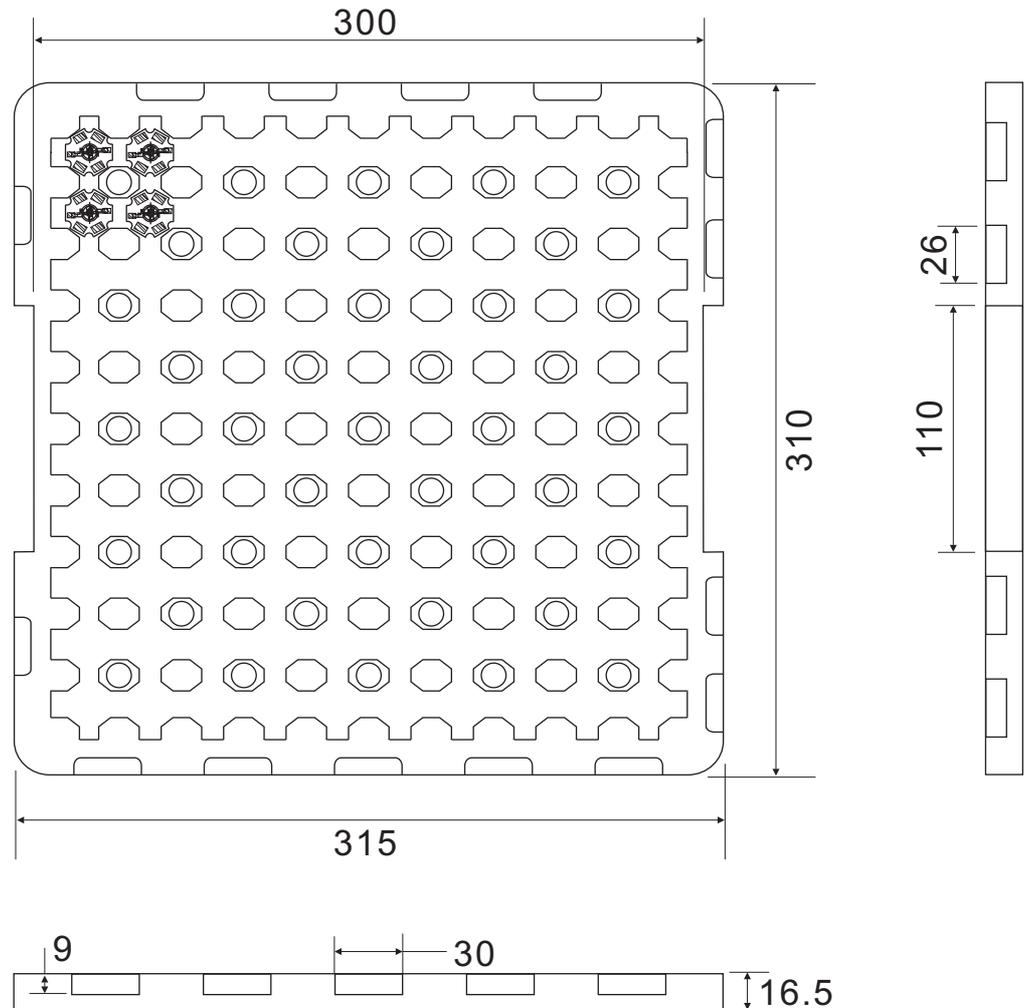
Package Dimension For Emitter Type



NOTE:

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

Package Dimension For Star Type



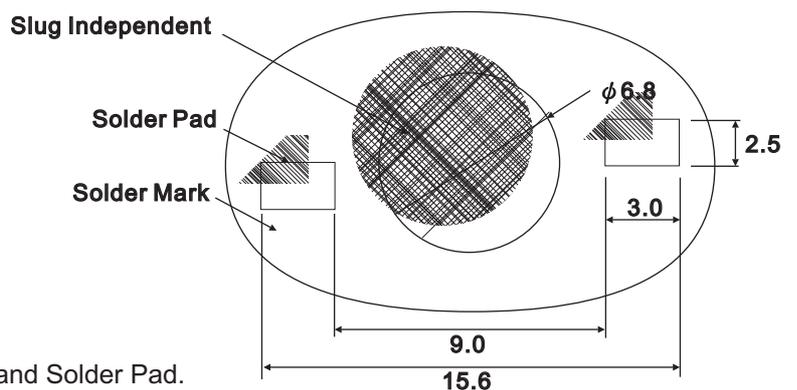
NOTE:

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.

Requirements to user For Emitter Type

The LED products 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

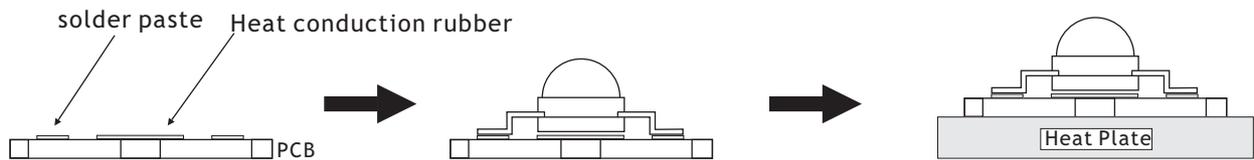


Note:

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

Heat Plate Soldering Condition For Emitter Type

a. Soldering Process for Solder Paste



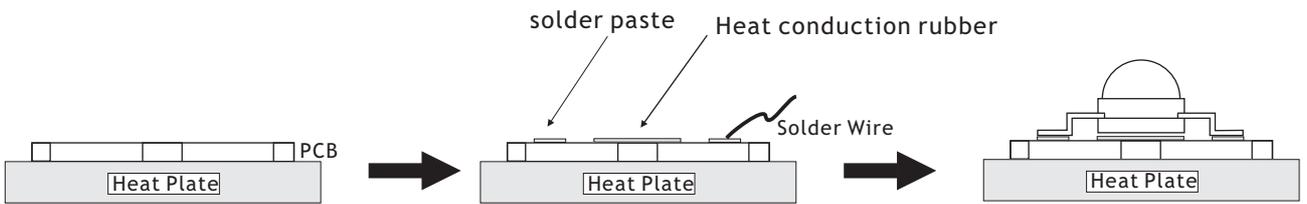
Use Solder Mask to print Solder Paste on PCB.

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: 230°C max for Lead Solder and 260°

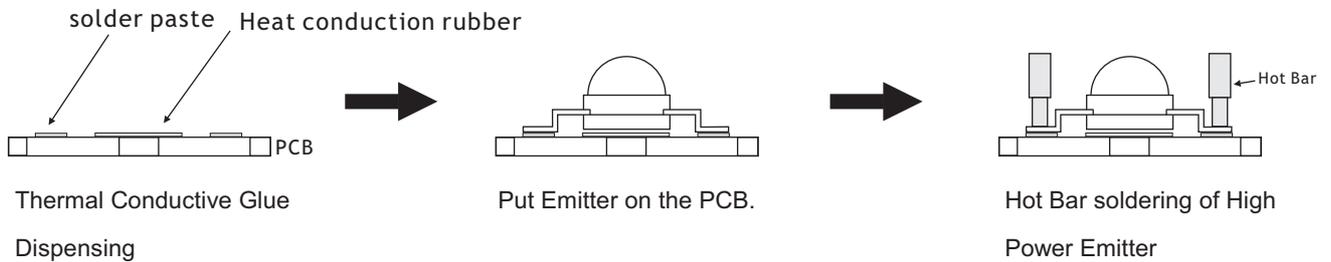
1.Heat plate temperature: 230°C

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.

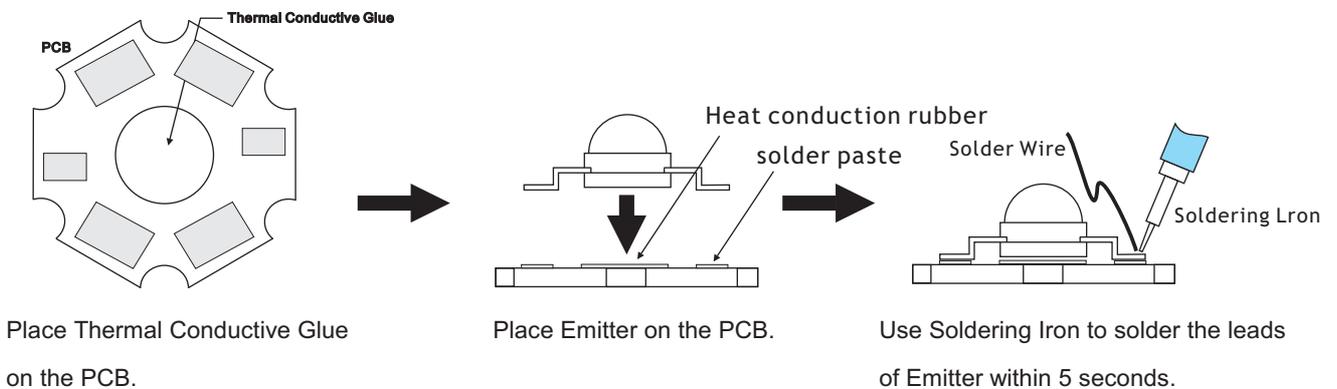
📄 Soldering Process For Hot Bar For Emitter Type



NOTE:

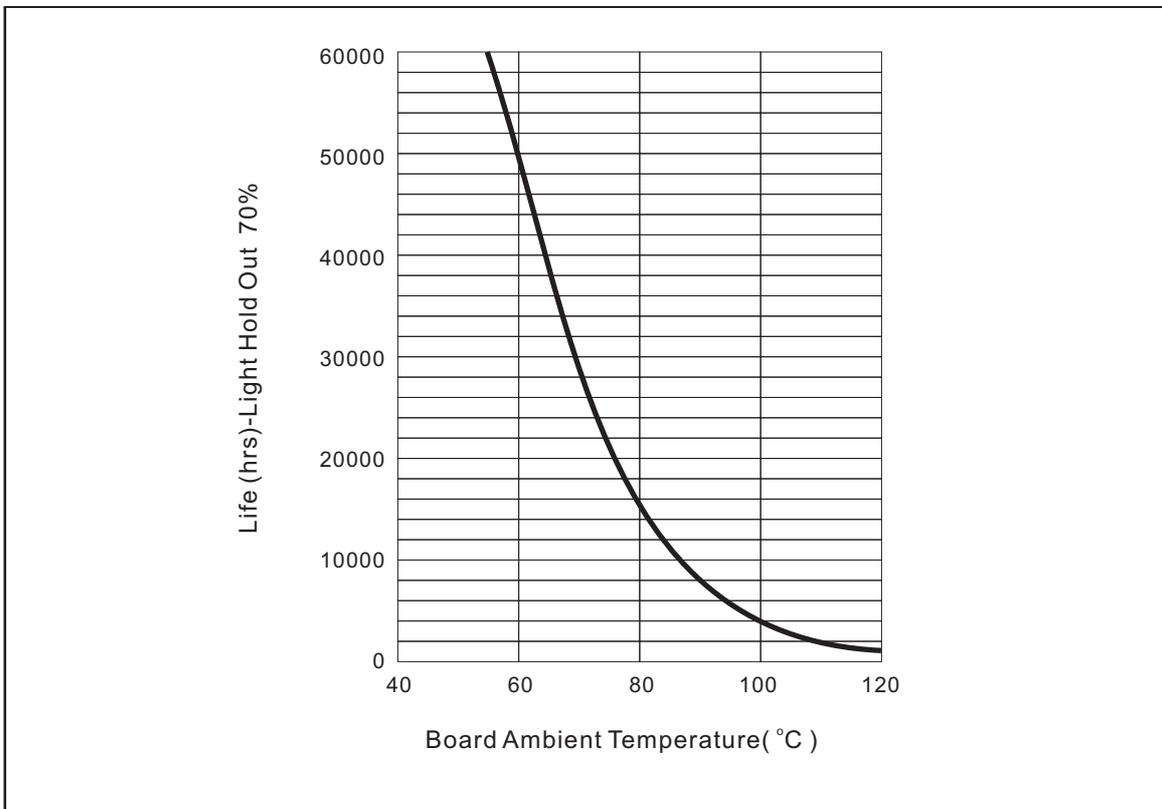
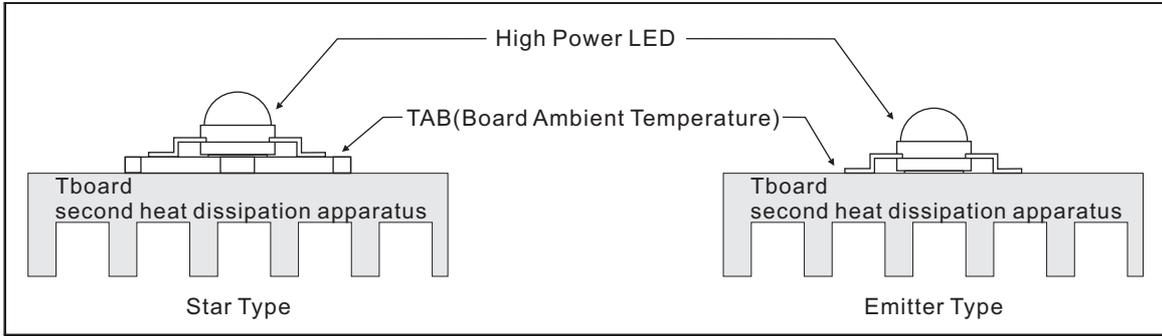
1. Hot Bar temperature: 230°C max for Lead Solder and 260°C max for Lead-Free Solder.
2. When soldering, do not put stress on the LEDs during heating.
3. After soldering, do not warp the circuit board.

📄 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.

☰ 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.

Remarks:

1. Brightness values are measured during a current pulse of typical 25 ms, the brightness tolerance is +/-15%.
2. Dominant wavelength are measured during a current pulse of typical 200 ms, the chromaticity tolerance is +/-1.0nm.
3. Forward voltage are measured during a current pulse of typical 5 ms, the VF tolerance is +/-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(Wavelength) 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.