Ledman Optoelectronic Co.,Ltd.

SPECIFICATIONS FOR LEDMAN HIGH POWER LED

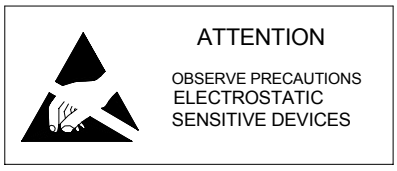
Model No. : LPEH03HQHR1-MF0
Document No. : LPS-40-105
Revision No. : 03

Description:

- 1W High Power LED
- Colloid Color: Water Transparent
- Emission Color: Red
- Viewing Angle :150°

Dice Material: AlGaInP

RoHS



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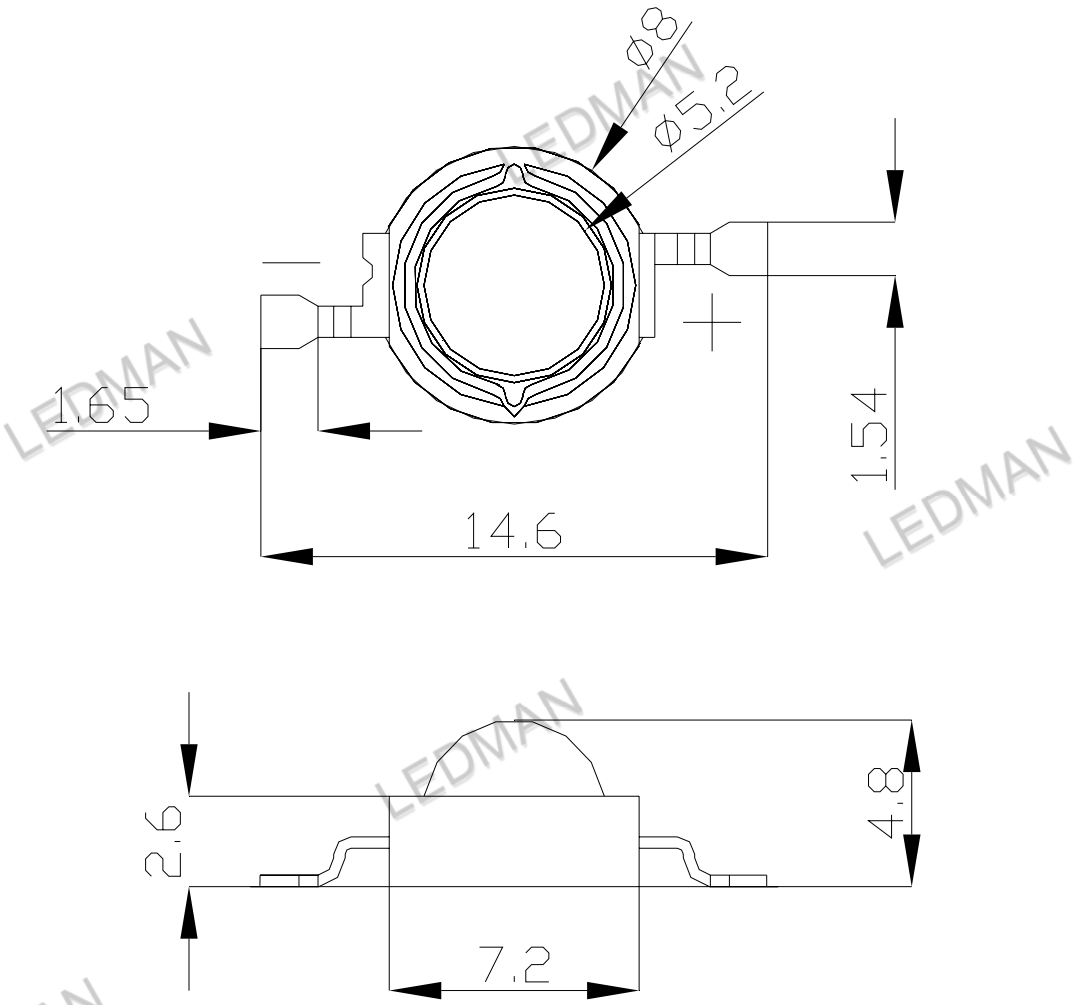
Outline Drawing



NOTES:

1. All dimensions area in mm tolerance is ±0.25mm unless otherwise noted.
2. Thermoelectric unseparation type high power LED.

Applications:

1	Signal lighting backlighting
2	Flashlight Headlight
3	Decorative entertainment and landscape lighting
4	Signage and channel letter

Absolute Maximum Ratings (T_a = 25°C)

Items	Symbol	Absolute maximum Rating	Unit
DC Forward Current	I_F	350	mA
Peak Forward Current*	I_{FP}	1000	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	770	mW
Operation Temperature	T_{opr}	-40 ~ +95	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

*pulse width <=0.1msec duty <=1/10

Typical Electrical & Optical Characteristics (Ta = 25°C)

Items	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F = 350mA	---	2.2		V
Reverse Current	I_R	V_R = 5V	---	---	10	μA
Color Temperature	λ_D	I_F = 350mA	---	622	---	nm
Luminous Flux	Φv	I_F = 350mA	---	40	---	lm
50% Power Angle	2 θ ½	I_F = 350mA	---	150	---	deg
Thermal Resistance （Junction to Board）	R_{J-B}	I_F = 350mA	---	15	---	°C/W

Important Notes:

1) All ranks will be included per delivery, rank ratio will be determined by Ledman.
2) Tolerance of measurement of V_F is ±0.1 V.
3) Tolerance of measurement of dominant wavelength is ±1nm.
4) Tolerance of measurement of luminous intensity is ±15%.
5) For Reliability test conditions and data, Please refer to“**Reliability Test** ” section on page 5
6) For how to use Ledman LED product safely ,Please refer to“**Application Notes**” section on page 7 to 9.
7) Packaging methods are available to be chosen from , please refer to **“packaging”** section on page 10.
8) As we are making continous efforts to improve the performance of LED, Specifications are subject to change without notice.
9) Information is tentative and subject to change without notice.

Typical Optical-Electronic Characteristic Curves:

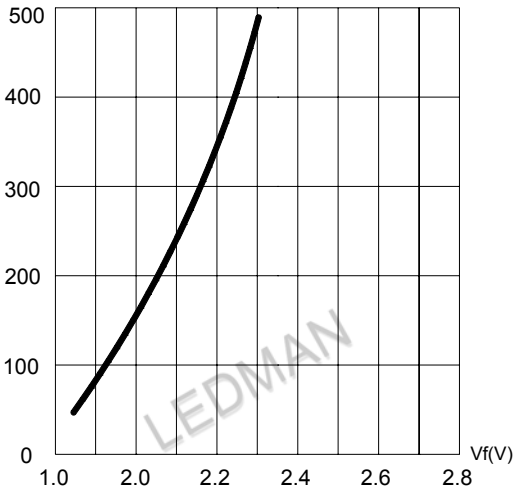


Fig.1 Forward Current vs. Forward Voltage

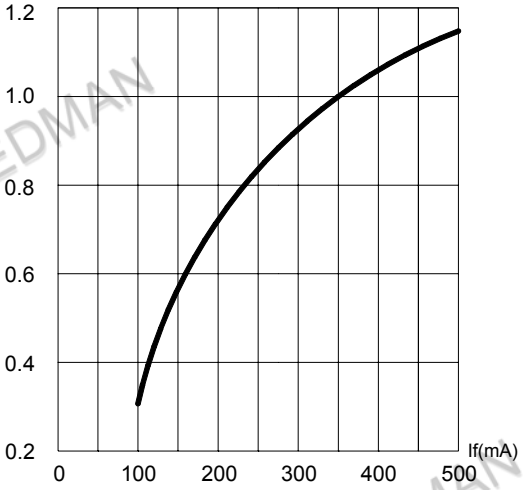


Fig.2 Relative Luminous Intensity vs. Forward Current

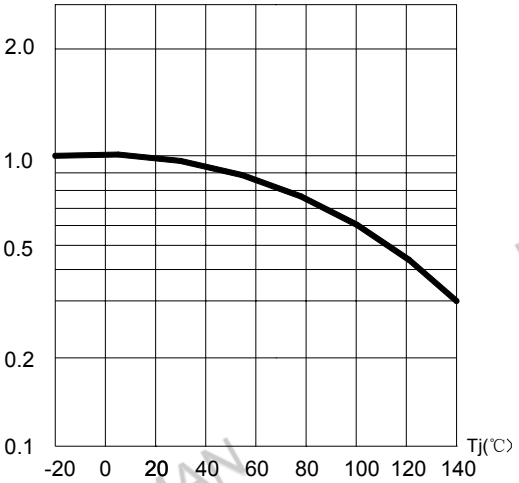


Fig.3 Relative Luminous Intensity vs. Ambient Temperature

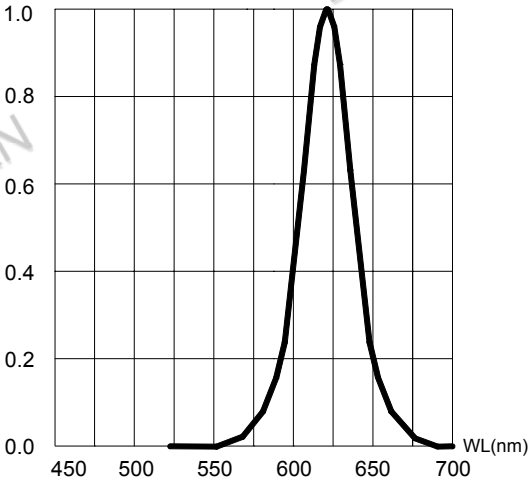


Fig.4 Relative Luminous Flux vs. Wavelength

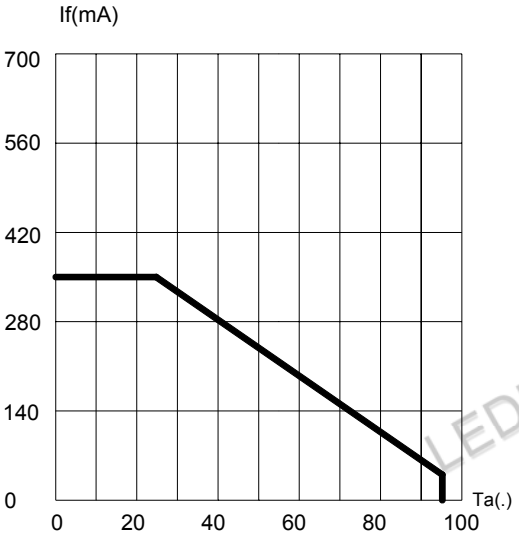


Fig.5 Maximum Forward Current vs. Ambient Temperature

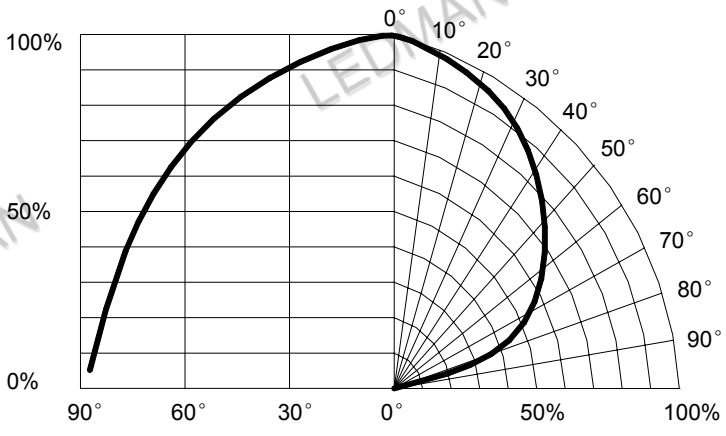


Fig.6 Relative Luminous Intensity vs.Radiation Angle

Reliability Test Standards

Test item:

Type	Test item	Applicable standard	Test condition	Duration	Sampling number	Accept criteria
environment test	Temperature cycles	JEITA ED-4701 100 105	-40℃～25℃～100℃～25℃ 30min 5min 30min 5min	100cycles	30	0/30
	Thermal shock	MIL-STD-202G	-40℃～100℃ 15min 15min	300cycles	30	0/30
	High humidity heat cycles	JEITA ED-4701 200 203	30℃～65℃ RH=90% 24hrs/1 cycle	50cycles	30	0/30
	High temperature storage	JEITA ED-4701 200 201	T_a=100℃	1000hrs	30	0/30
	Low temperature storage	JEITA ED-4701 200 202	T_a=-40℃	1000hrs	30	0/30
	High temperature & high humidity storage	JEITA ED-4701 100 103	T_a=60℃ RH=90%	1000hrs	30	0/30
life test	Normal temperature life test		T_a=25℃ I_F=350mA	1000hrs	30	0/30
	High temperature & high humidity life test		T_a=60℃ RH=90% If=250mA	1000hrs	30	0/30
	Low temperature life test		T_a=-30℃ I_F=300mA	1000hrs	30	0/30
destructive experiment	Resistance to soldering heat	JEITA ED-4701 300 301	T_{sol}=260℃±5℃,10sec	one time	5	0/30
	Solderability		T_{sol}=245℃±5℃,5sec using flux	one time	5	0/30
physical experiment	Vibration	JEITA ED-4701 400 403	20G 20-2000HZ 4mins X,Y,Z 3directions	each 4cycles	5	0/30
	Drop		75CM	3 times	5	0/30

Failure Criteria:

Item	Symbol	Test condition	Criteria for Judgment
Forward Voltage	V_F	I_F=350mA	Initial Data±10%
Reverse Current	I_R	V_R=5V	≦10μA
Luminous flux	φ_V	I_F=350mA	Single led degradation ≦50% and Average degradation ≦
Solderability			Over 95%
Vibration		I_F=350mA	No dead lamps or visual damage
Drop		I_F=350mA	No dead lamps or visual damage

Remark: RH:Environment humidity； T_a:Environment temperature；
T_{sol}:Tin temperature； I_F:Forward current； V_R:Reverse voltage.

High Power LED Product Naming Rule

L P X XXX XX XX X — X XX __

1 23 1 2

9 Serial number of product creation

8 50% Power Angle（2θ1/2）
C0：120°
D0：135°

7 the shape of lens
L： Lambertian
M：Molding
T： Top viewing

6 Power Dissipation
0：0.5W
1：1W
3：3W

5 Emitted color distinguishing
YL：Yellow
HR： Red
PG： Green
BL： Blue
WW：white
WR： warm white

4 Chip, code-named
1：The manufacturer code
2：The size code

3 Bracket, code-named
1： The manufacturer code
23：Serial number

2 The substrate appearance shape
E：Without substrate
S：Star
R：Round
F：Quadrate

1 Product Type
P：High-Power LED

Ledman code

Application Notes

Storage

1. Before opening the package,the LEDs should be kept under the condition < 30ºC and < 90%RH. After opening the package,the LEDs should be stored under the condition < 30ºC and < 70%RH.
2. The LEDs should be used within a year. And after opening the package, The LEDs should be used within 168 hours (7 days).
3. If the desiccant is faded or the LEDs have exceeded the storage time, Re-baking is required under the condition 60±6℃ for 24 hours.
4. The lens of LEDs is prone to attact dust so the relevant steps should be taken to keep the emitter free of dust.

Handling

Handle the component along the side surfaces by using forceps or appropriate tools. The forceps or other appropriate tools should not put any pressure on the lens, it's also strictly forbidden to poke and press the lens.

Thermal Management

When the LED is drived by large current, the TJ (junction temperature) will exceed its limit, which will shorten the lifetime of LEDs seriously. The thermal management should effectively reduce the thermal resistance of products.

The general way for the thermal management is to mount the LED on a metal core printed circuit board(MCPCB).It is recommended that the surface area of the MCPCB is at least 30 cm^2 for 1W LED(and 80cm^2 for 3W LED),and the MCPCB material with a thermal conductivity greater than 2.0W/mK.The thermal glue or paste should with a thermal conductivety greater than1.0W/mK and its thickness must be less than 100um.

Soldering/Reflow Soldering

1.Soldering Iron

It is recommended to solder by soldering iron with the soldering iron tip temperature less than 350℃ and with the time less than 3 seconds. The power of soldering iron should be less than 60W. After finishing one lead soldering, wait 2 seconds or more for another lead soldering.

Do not press the lens while soldering, the problems often start at the time of soldering, so be careful for the soldering.

2. Reflow Soldering Conditions

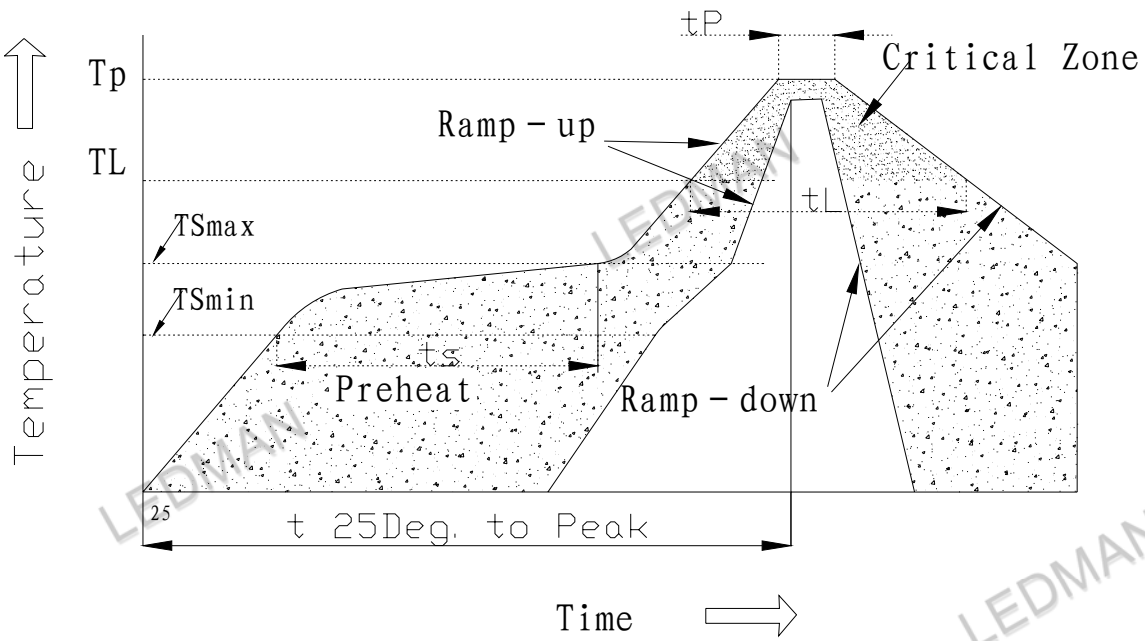


Table of Classification Reflow Profiles:

Profile Feature	Sn-Bi Electric Assembly	Sn-Free Electric Assembly
Average ramp-up rate (TL to TP)	3℃/second max.	3℃/second max.
Preheat -Temperature Min.(Tsmin) -Temperature Min.(Tsmax)	60-120seconds 100℃ 130℃	60-180seconds 150℃ 200℃
Tsmax to TL -Ramp-up Rate	3℃/second	3℃/second
Time maintained aboveTL	160℃/60-150seconds	210℃/60-150seconds
Peak Temperature(TP)	190+0/-5℃	250+0/-5℃
Time within 5℃ of Actual Peak Temperture(TP)	10 seconds	10 seconds
Ramp-down Rate	6℃/Seconds max.	6℃/Seconds max.
Time 25℃ to Peak Temperture	6 minutes max.	8 minutes max.

Notes:

(a)Reflow soldering should not be done more than two times.

(b)While soldering,do not put stress on the LEDs during heating.

(c)After soldering,do not warp the circuit board.

Cleaning

When cleaning is necessary,using the clean soft cloth and dipping the isopropyl alcoho to erasure the dirt gently. Do not clean it with the solvents such as Acetone,lest erode or destroy the LEDs.

Electrical Notes

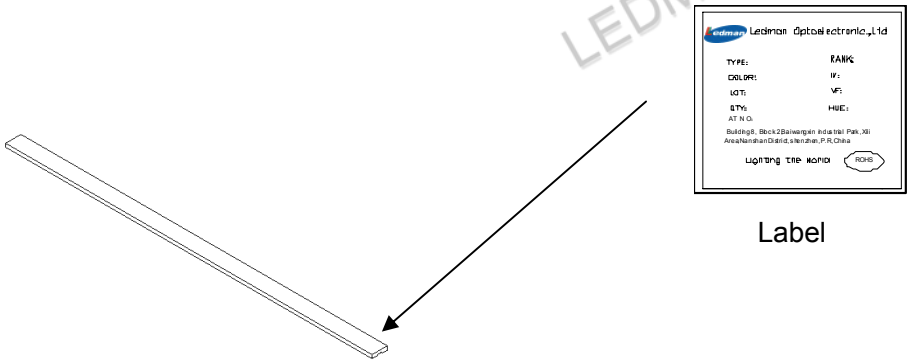
1. The LED can not be drived reversely.
2. It's necessary to have the measures to limit the current Otherwise slight voltage shift may cause enormous current change and results in the failure of LEDs.
3. It is recommended that the drive current should be lower when the light output is enough for applying.It would be helpful to improve the product's reliability.

Antistatic

The LEDs are electrostatic sensitive devices,so antistatic steps should be taken during the processing.

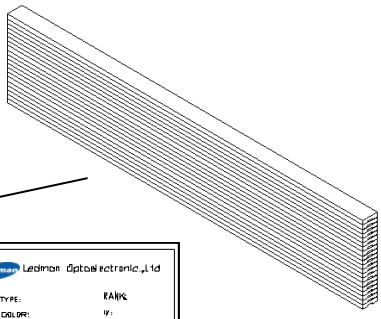
Packaging Specifications of High Power

Tube packaging Specifications for Lambertian series products of high power:

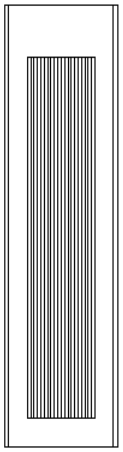


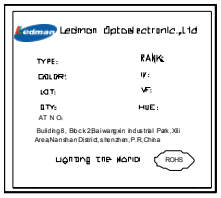
Label

Tube: 420mm*18mm*8.5mm



Mouth of anti-electrostatic bag

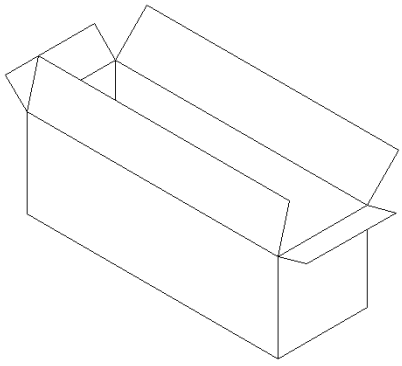




Label

Two packages of desiccant

Anti-electrostatic bag: 515mm*150mm



Carton: 500mm*300mm*200mm

Type	Quantity per tube	Tubes per bag	Bags per carton	Quantity Total	Remark
Tube pack	50pcs	10	20	10000pcs	Lambertian series products of high power

Indication：We can use cardboard box to package ,only if there are enough products.