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Luckylight

1W High Power Purple LED
Technical Data Sheet

Part No.: LL-HP60MUVA

Features:



- ◇ High power LED type.
- ◇ Lead frame type package (Heat sink type).
- ◇ Thermal conductive lead frame Package.
- ◇ Compatible to Pb-free IR reflow soldering.
- ◇ Very long operating life.
- ◇ Instant light (less than 100 ns).
- ◇ Designed for high current operation.
- ◇ Low thermal resistance.
- ◇ High reliable.
- ◇ The product itself will remain within RoHS complaint Version.

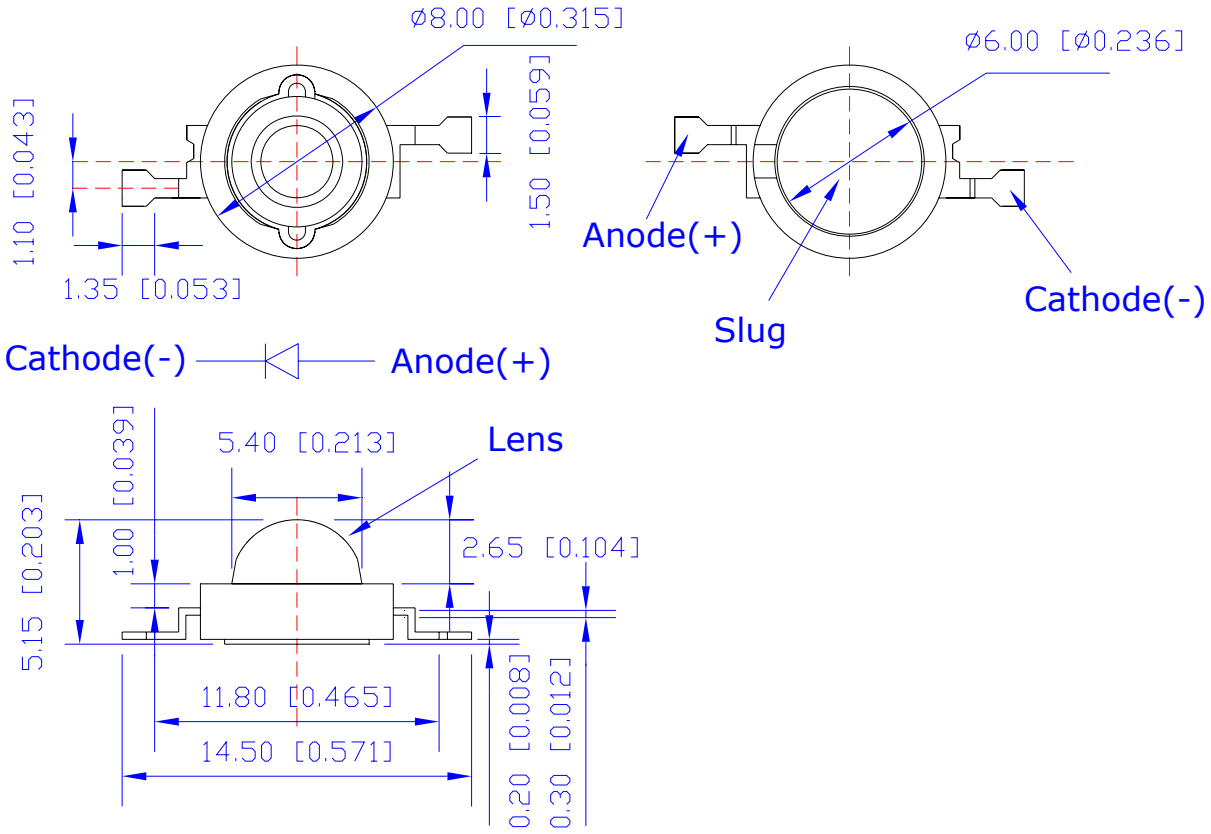
Descriptions:

- ◇ The HP60XXX series is specially designed for applications requiring higher brightness. The series is available in soft red, orange, yellow, green, blue, and white. Due to its package design, the LED has wide viewing angle and very good thermal emission.
- ◇ Utilizing advanced InGaN chip technology.

Applications:

- ◇ Counterfeit money detector.
- ◇ Sterilization.
- ◇ Medical instrument.
- ◇ Industrial use.

Package Dimension:



Part No.	Chip Material	Lens Color	Source Color
LL-HP60MUVA	InGaN	Water Clear	Purple

Notes:

1. All dimensions are in millimeters.
2. Tolerance is ± 0.10 mm (.004”) unless otherwise noted.
3. Specifications are subject to change without notice.

Absolute Maximum Ratings at Ta=25℃

Parameters	Symbol	Max.	Unit
Power Dissipation	PD	1.40	W
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	IFP	500	mA
Forward Current	IF	350	mA
Reverse Voltage	VR	5	V
Electrostatic Discharge (HBM) (JESD22-A 114-B)	ESD	400	V
Operating Temperature Range	Topr	-40℃ to +80℃	
Storage Temperature Range	Tstg	-40℃ to +85℃	
Soldering Temperature	Tsld	260℃ for 5 Seconds	

Electrical Optical Characteristics at Ta=25℃

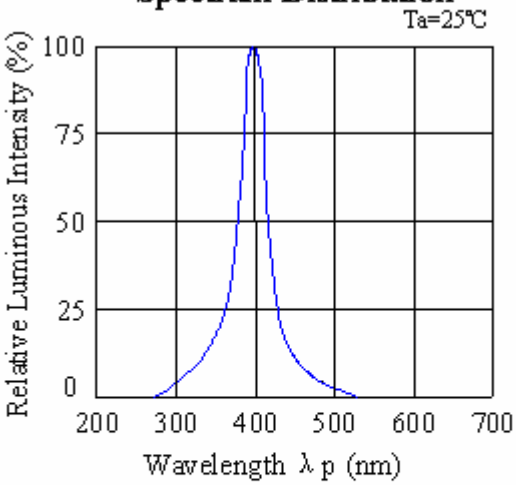
Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Flux	Φv	0.20	0.80	---	lm	IF=350mA (Note 1)
Viewing Angle	2θ1/2	---	135	---	Deg	IF=350mA (Note 2)
Peak Emission Wavelength	λp	---	400	---	nm	IF=350mA
Dominant Wavelength	λd	---	405	---	nm	IF=350mA (Note 3)
Spectral Bandwidth	△λ	---	15	---	nm	IF=350mA
Forward Voltage	VF	2.80	3.40	4.00	V	IF=350mA
Reverse Current	IR	---	---	50	μA	V_R=5V

Notes:

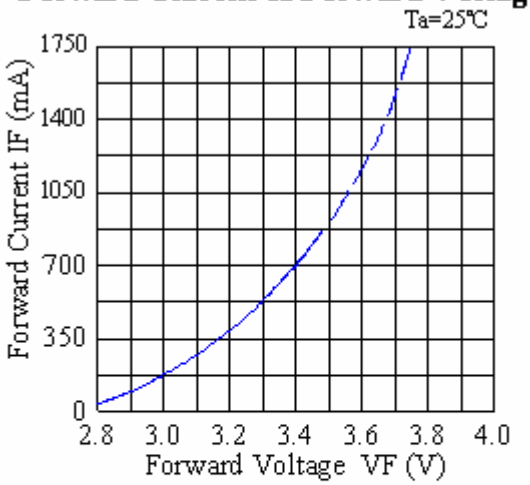
1. Luminous Intensity (Flux) Measurement allowance is ± 10%.
2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
3. The dominant wavelength (λd) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Typical Electrical / Optical Characteristics Curves
(25℃ Ambient Temperature Unless Otherwise Noted)

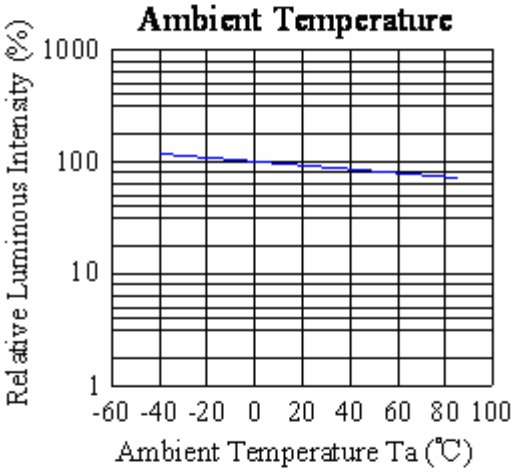
Spectrum Distribution



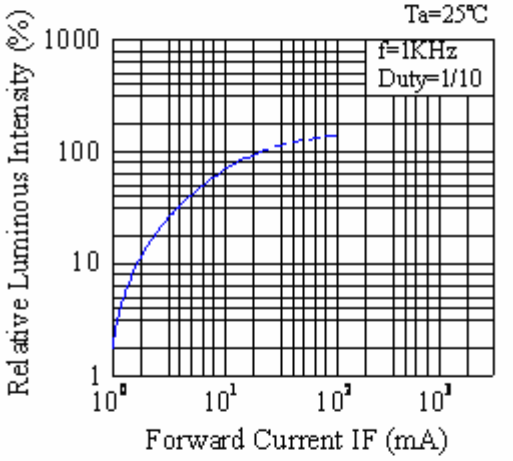
Forward Current & Forward Voltage



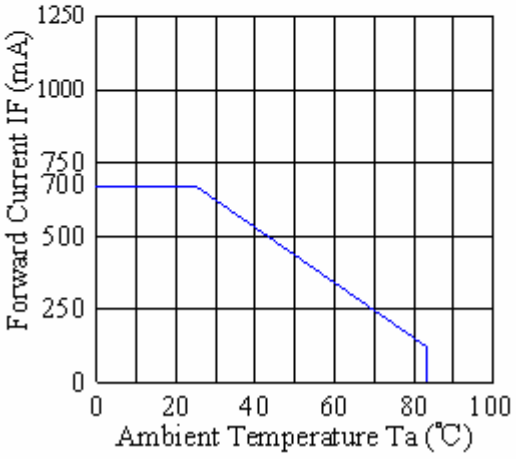
Luminous Intensity & Ambient Temperature



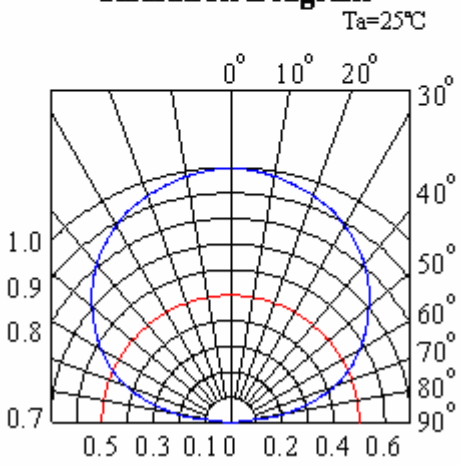
Luminous Intensity & Forward Current



Forward Current Derating Curve



Radiation Diagram



Reliability Test Items and Conditions:

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%.

LTPD: 10%.

1) Test Items and Results:

No.	Test Item	Test Hours/Cycles	Test Conditions	Sample Size	Ac/Re
1	Resistance to Soldering Heat	6 Min	Tsld=260±5℃, Min. 5sec	25pcs	0/1
2	Thermal Shock	300 Cycles	H: +100℃ 5min ∫ 10 sec L: -10℃ 5min	25pcs	0/1
3	Temperature Cycle	300 Cycles	H: +100℃ 15min ∫ 5min L: -40℃ 15min	25pcs	0/1
4	High Temperature Storage	1000Hrs.	Temp: 100℃	25pcs	0/1
5	DC Operating Life	1000Hrs.	IF=350mA	25pcs	0/1
6	Low Temperature Storage	1000Hrs.	Temp: -40℃	25pcs	0/1
7	High Temperature/ High Humidity	1000Hrs.	85℃/85%RH	25pcs	0/1

2) Criteria for Judging the Damage:

Item	Symbol	Test Conditions	Criteria for Judgment	
			Min	Max
Forward Voltage	VF	IF=350mA	---	F.V.*)×1.1
Reverse Current	IR	VR=5V	---	F.V.*)×2.0
Luminous Intensity	IV	IF=350mA	F.V.*)×0.7	---

*) F.V.: First Value.

Precautions For Use:

1. Over-current-proof

Though the high power LED has conducted ESD protection mechanism, customer must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause enormous current change and burn out failure would happen.

2. Storage

① Do not open moisture proof bag before the products are ready to use.

② Before opening the package, the LEDs should be kept at 30℃ or less and 90%RH or less.

③ The LEDs should be used within a year.

④ After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.

⑤ The LEDs should be used within 168 hours (7 days) after opening the package.

⑥If the moisture absorbent material (silicone gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

⑦ Pre-curing treatment: 60±5℃ for 24 hours.

3. Thermal Management

① Because the LED is a high power dissipation device, special and sufficient consideration in thermal management design must be made to optimize the thermal performance.

② Heat sink design is implemented in the device for an additional thermal connection. Since the device is capable of SMT process, tin must be spread both heat sink and solder pads areas to dissipate the heat.

③ A high thermal conductivity substrate, such as Aluminum or Copper plate etc, must be applied for external thermal management. It is strongly recommended that the outer heat sink or PCB dimension per LED can not be less than 25 × 25 × 1 (L × W × H) mm. The materials for outer heat sink can be FR4 on Aluminum, MCPCB, or FPC on Aluminum.

④ Special thermal designs are also recommended to take in outer heat sink design, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc.

⑤ Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

4. Soldering Condition

① Soldering should not be done more than two times.

② While soldering, do not put stress on the LEDs during heating.

③ After soldering, do not warp the circuit board.

5. Soldering Iron

① For prototype builds or small series production runs it is possible to place and solder the LED by hand.

②It is recommended to hand solder the leads with a solder tip temperature of 280°C for less than 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals,

and do soldering of each terminal.

③ Be careful because the damage of the product is often started at the time of the hand solder.

6. Handling Indications

① During processing, mechanical stress on the surface should be minimized as much as possible.

② Sharp objects of all types should not be used to pierce the sealing compound.