

EHP-AX08B/UB01-P01

Features

- Feature of the device: small package with high efficiency
- Typical view angle: 100°.
- Typical light flux output: 14 lm @ 350mA.
- ESD protection.
- Soldering methods: Hot bar soldering.
- Grouping parameter: total luminous flux, dominant wavelength
- Typical optical efficiency: 11 lm/W.
- Thermal resistance (junction to lead): 15 K/W.
- The product itself will remain within RoHS compliant version

**Applications**

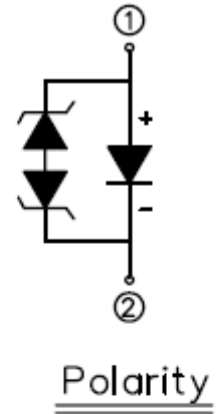
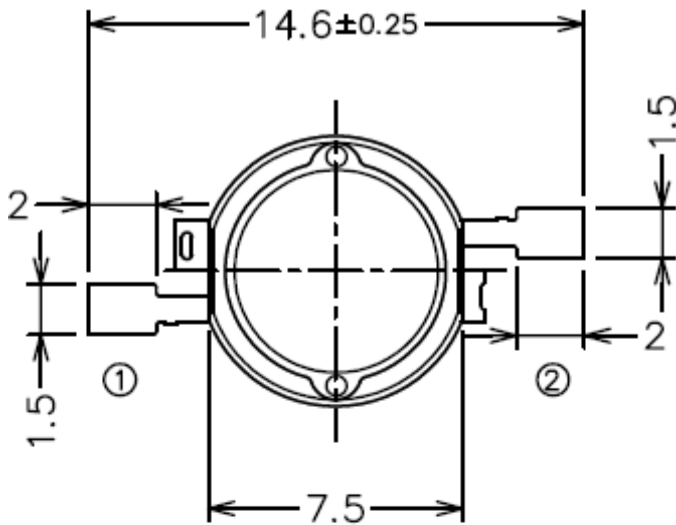
- TFT LCD display backlight
- Decorative and entertainment illumination
- Signal and symbol luminaries for orientation marker lights (e.g. steps, exit ways, etc.)
- Exterior and interior automotive illumination

Materials

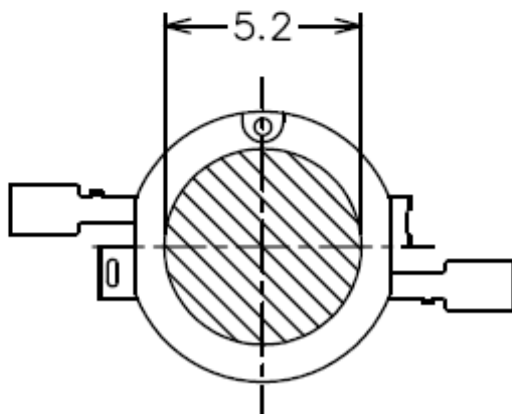
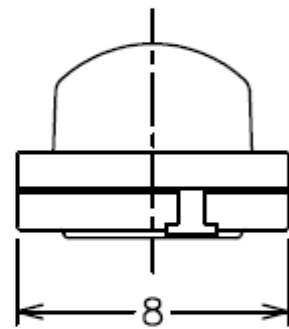
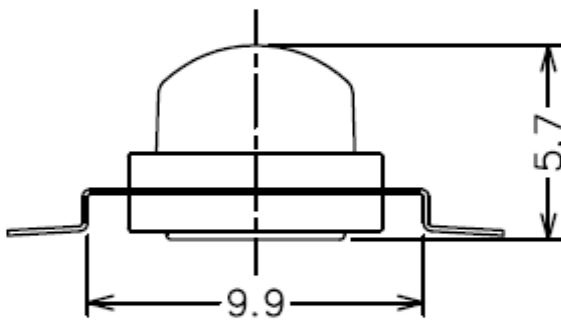
| Items | Description |
|---------------------|------------------------------|
| Housing black body | Heat resistant polymer |
| Encapsulating Resin | Silicone resin |
| Lens | Heat resistant clear polymer |
| Electrodes | Ag plating copper alloy |
| Die attach | Silver paste |
| Chip | InGaN |

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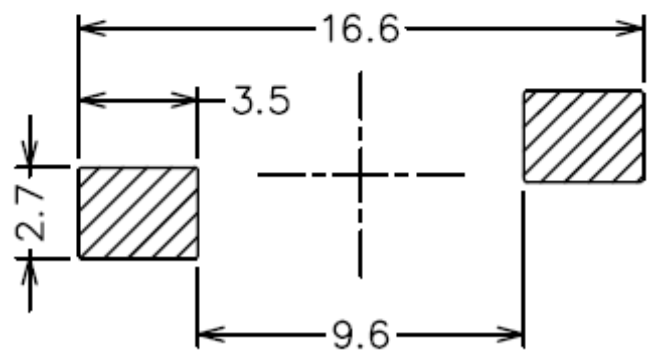
Dimensions



Polarity



Bot. view



Soldering patterns

Notes: 1. Dimensions are in millimeters.

2. Tolerances unless dimensions ±0.25mm.

EHP-AX08B/UB01-P01
Maximum Ratings ($T_{Ambient}=25^{\circ}C$)

| Parameter | Symbol | Rating | Unit |
|--|-----------|------------|------|
| Operating Temperature | T_{opr} | -40 ~ +100 | °C |
| Storage Temperature | T_{stg} | -40 ~ +110 | °C |
| Junction temperature | T_j | 125 | °C |
| Pulse Forward Current | I_F | 500 | mA |
| Power Dissipation | P_d | 2.0 | W |
| Junction to heat-sink thermal resistance | R_{th} | 15 | K/W |

Electro-Optical Characteristics ($T_{Ambient}=25^{\circ}C$)

| Parameter | Bin | Symbol | Min | Typ. | Max | Unit | Condition |
|--------------------------------|------|-----------------|------|------|------|------|-----------------------|
| Luminous Flux ₍₁₎ | F2 | ϕ_v | 10 | ---- | 13 | lm | I _F =350mA |
| | F3 | | 13 | ---- | 17 | | |
| | F4 | | 17 | ---- | 20 | | |
| Forward Voltage ₍₂₎ | V2 | V_F | 3.25 | ---- | 3.55 | V | |
| | V3 | | 3.55 | ---- | 3.85 | | |
| | V4 | | 3.85 | ---- | 4.15 | | |
| Viewing Angle ₍₃₎ | ---- | $2\theta_{1/2}$ | ---- | 100 | ---- | deg | |
| Wavelength ₍₄₎ | B6 | λ_d | 455 | ---- | 460 | nm | |
| | B7 | | 460 | ---- | 465 | | |
| | B8 | | 465 | ---- | 470 | | |

Note. 1. Luminous Flux measurement tolerance: $\pm 10\%$

2. Forward Voltage measurement tolerance: $\pm 0.1V$

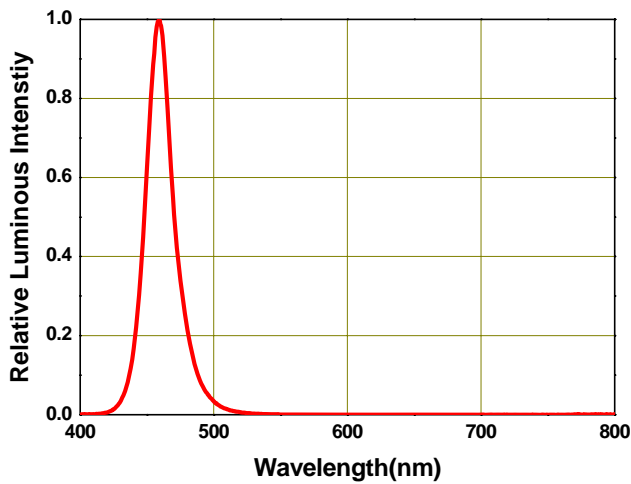
3. $2\theta_{1/2}$ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.

4. Wavelength measurement tolerance : $\pm 1nm$

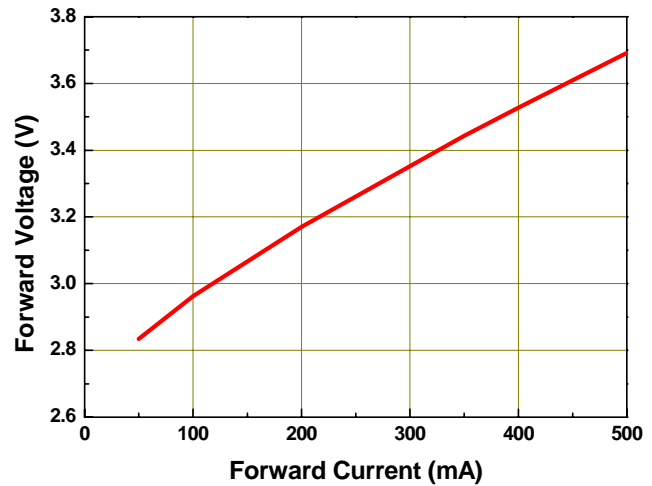
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Typical Electro-Optical Characteristics Curves

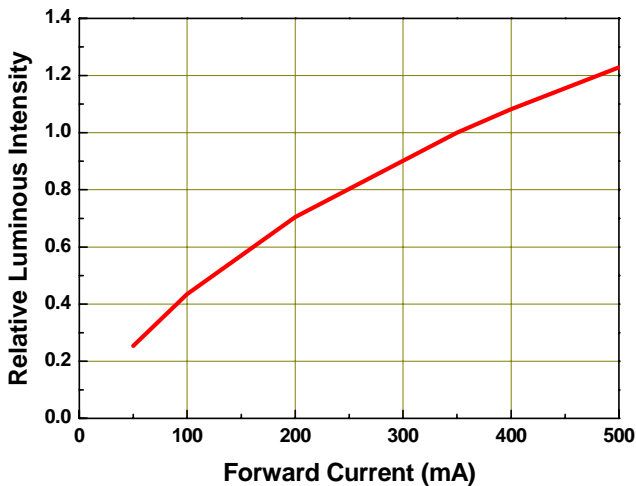
Relative Spectral Distribution,
 $I_F=350\text{mA}$, $T_{\text{Ambient}}=25^\circ\text{C}$



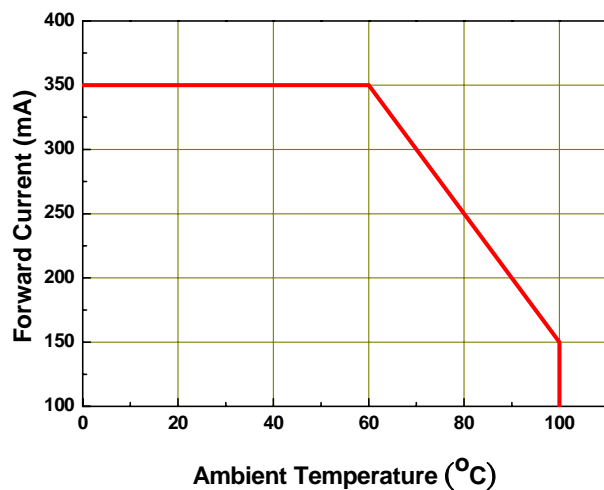
Forward Voltage vs Forward Current,
 $T_{\text{Ambient}}=25^\circ\text{C}$



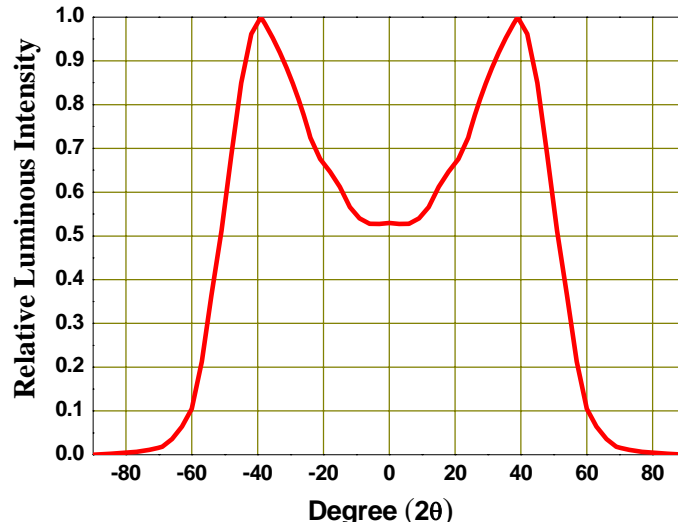
Relative Luminous Intensity vs Forward Current, $T_{\text{Ambient}}=25^\circ\text{C}$



Forward Current Derating Curve,
Derating based on $T_{\text{IMAX}}=125^\circ\text{C}$



Typical Representative Spatial Radiation Pattern



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Label explanation

CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: Dominant Wavelength

REF: Reference

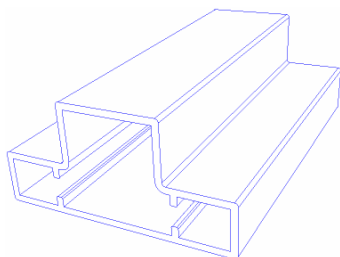
LOT No: Lot Number

MADE IN TAIWAN: Production Place

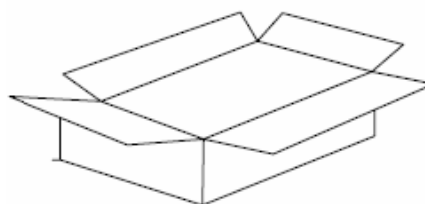


Tube Packing Specifications

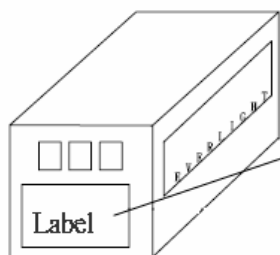
1. Tube



2. Inner Carton



3. Outside Carton



● **Packing Quantity**

1. 60 Pcs / Per Tube
2. 20 Tubes / Inner Carton
3. 12 Inner Cartons / Outside Carton

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Reliability Test Items and Results

| Stress Test | Stress Condition | Stress Duration |
|--|--|-----------------|
| Solderability | Tsol=230°C, 5sec | 1 times |
| Resistance to Solder Heat | Tsol=260°C, 10sec, 6min | 3 times |
| Thermal Shock | H : + 110°C 20min. 'J 10sec. 'L : - 40°C 20min. | 500 Cycles |
| Temperature Cycle | H : + 100°C 30min. 'J 5min. 'L : - 40°C 30min. | 1000 Cycles |
| High Temperature/Humidity Reverse Bias | Ta=85°C , RH=85% | 1000hours |
| High Temperature/Humidity Operation | Ta=85°C , RH=60%, IF=225mA | 1000hours |
| High Temperature Storage | Ta=110°C | 1000hours |
| Low Temperature Storage | Ta=-40°C | 1000hours |
| Intermittent operational Life | Ta=25°C, IF=1000mA 30mS on/ 2500mS off | 1000hours |
| High Temperature Operation Life #1 | Ta=55°C, IF=350mA | 1000hours |
| High Temperature Operation Life #2 | Ta=85°C, IF=225mA | 1000hours |
| High Temperature Operation Life #3 | Ta=100°C, IF=150mA | 1000hours |
| Low Temperature Operation Life | Ta=-40°C, IF=350mA | 1000hours |
| Power Temperature Cycle | H : + 85°C 15min. 'J 5min. 'L : - 40°C 15min. IF=225mA, 2min on/off | 1000cycles |
| ESD Human Body Model | 2000V, Interval:0.5sec | 3 times |
| ESD Machine Model | 200V, Interval:0.5sec | 3 times |

*Im: BRIGHTNESS ATTENUATE DIFFERENCE(1000hrs)<50%

*VF: FORWARD VOLTAGE DIFFERENCE < 20%

Precautions For Use

1. Over-current-proof

Though EHP-A08 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.

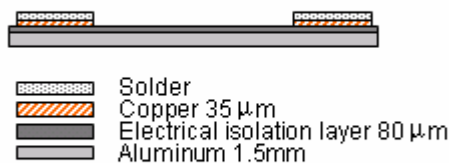
2. Storage

- i. Do not open moisture proof bag before the products are ready to use.
- ii. Before opening the package, the LEDs should be kept at 30°C or less and 90%RH or less.
- iii. The LEDs should be used within a year.
- iv. After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.
- v. The LEDs should be used within 168 hours (7 days) after opening the package.
- vi. If 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.
- vii. Pre-curing treatment : 60±5°C for 24 hours.

3. Thermal Management

- i. For maintaining the high flux output and achieving reliability, EHP-A08 series LED package should be mounted on a metal core printed circuit board (MCPCB) with proper thermal connection to dissipate approximately 1W of thermal energy under 350mA operation.

MCPCB structure

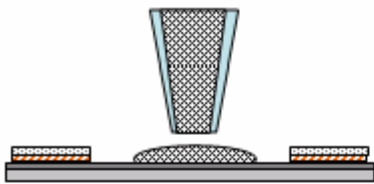


Recommended supplier:
 ▪ [Kavano Industrial Co., Ltd](#)
 ▪ [TT Electronics](#)

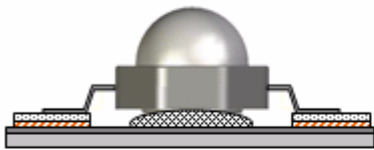
- ii. Special thermal designs are also recommended to take in outer heat sink design, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc.
- iii. Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

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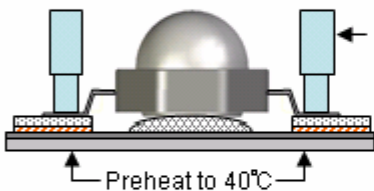
4. Assembly process flow



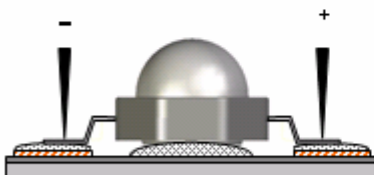
Thermal conductive glue dispensing
 Recommended material and its supplier: EpoTek T7109 from Epoxy Technology



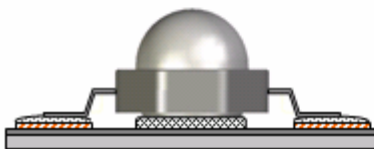
EHP-A08 LED emitter placement



Hot bar soldering of LED emitter
 Note: The MCPCB should be preheated up to 40°C for increasing the solderability



Functional test of LED emitter



Curing of thermal conductive glue

Handling Indications : Do not handle the EHP-A08 by the lens at any time during the assembly process. This can cause damage to the optical surfaces or may dislocate the lens if excessive force is applied.

5. Soldering Iron

- i. For prototype builds or small series production runs it is possible to place and solder the LED by hand.
- ii. Dispensing thermal conductive glue or grease on the substrates and follow its curing spec. Press LED housing to closely connect LED and substrate.

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- iii. It 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.
- iv. Be careful because the damage of the product is often started at the time of the hand solder.