

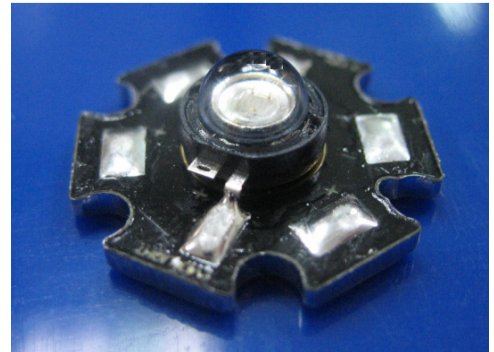
## Technical Data Sheet

## High Power LED – 1W (Preliminary)

EHP-A08L-HA/SUG01-P01

**Features**

- Feature of the device: small package with high efficiency
- View angle: 130°.
- High light flux output: more than 50lm@350mA.
- ESD protection.
- Soldering methods: Hot bar soldering
- Grouping parameter: total luminous flux, dominant wavelength.
- Optical efficiency: 37 lm/W.
- Thermal resistance (junction to heatsink):25K/W.
- The product itself will remain within RoHS compliant version.

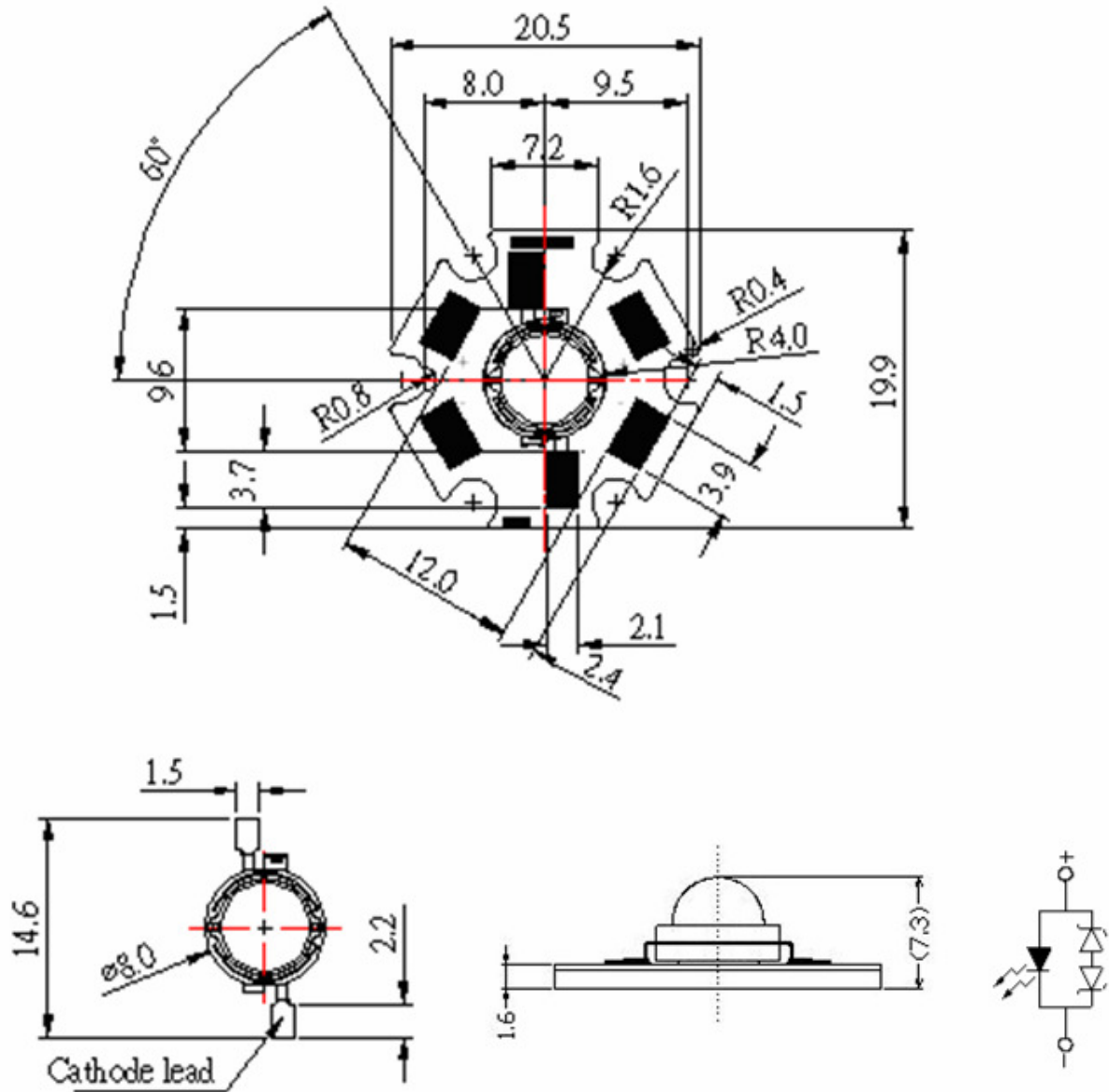
**Applications**

- 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                  |
|---------------------|------------------------------|
| Heatsink            | MCPCB                        |
| 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                        |

**Dimensions**



- Notes:**
1. Dimensions are in millimeters
  2. Tolerances unless dimensions  $\pm 0.25\text{mm}$

**Maximum Ratings ( $T_{Ambient}=25^{\circ}C$ )**

| Parameter                                | Symbol    | Rating     | Unit        |
|--|-----------|------------|-------------|
| Operating Temperature                    | $T_{opr}$ | -40 ~ +100 | $^{\circ}C$ |
| Storage Temperature                      | $T_{stg}$ | -40 ~ +100 | $^{\circ}C$ |
| Junction temperature                     | $T_j$     | 125        | $^{\circ}C$ |
| Forward Current                          | $I_F$     | 500        | mA          |
| Power Dissipation                        | $P_d$     | 2.0        | W           |
| Junction to heat-sink thermal resistance | $R_{th}$  | 25         | K/W         |

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

| Parameter                      | Bin  | Symbol          | Min  | Typ. | Max  | Unit | Condition   |
|--------------------------------|------|-----------------|------|------|------|------|-------------|
| Luminous Flux <sub>(1)</sub>   | J3   | $\Phi_v$        | 33   | ---- | 39   | lm   | $I_F=350mA$ |
|                                | J4   |                 | 39   | ---- | 45   |      |             |
|                                | J5   |                 | 45   | ---- | 52   |      |             |
|                                | K1   |                 | 52   | ---- | 60   |      |             |
| Viewing Angle <sub>(2)</sub>   | ---- | $2\theta_{1/2}$ | ---- | 130  | ---- | deg  |             |
| Forward Voltage <sub>(3)</sub> | V2   | $V_F$           | 3.25 | ---- | 3.55 | V    |             |
|                                | V3   |                 | 3.55 | ---- | 3.85 |      |             |
|                                | V4   |                 | 3.85 | ---- | 4.15 |      |             |
| Wavelength <sub>(4)</sub>      | C6   | $\lambda_d$     | 515  | ---- | 520  | nm   |             |
|                                | G1   |                 | 520  | ---- | 525  |      |             |
|                                | G2   |                 | 525  | ---- | 530  |      |             |
|                                | G3   |                 | 530  | ---- | 535  |      |             |

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

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

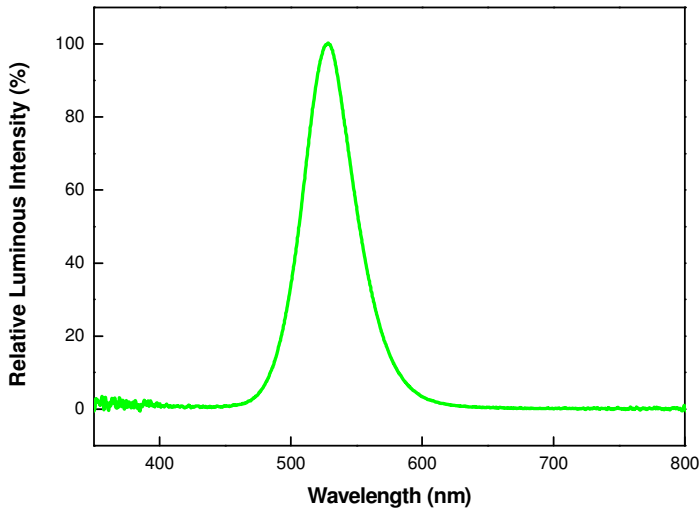
3. Forward Voltage measurement tolerance :  $\pm 0.1V$

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

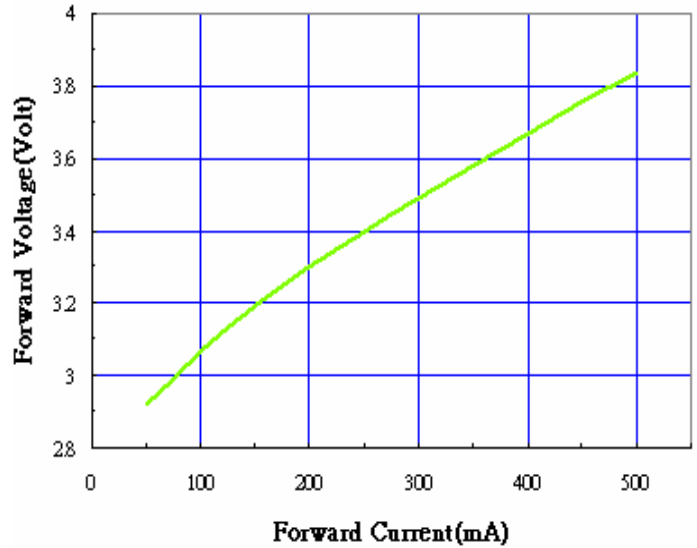
**EHP-A08L-HA/SUG01-P01**

Typical Electro-Optical Characteristics Curves

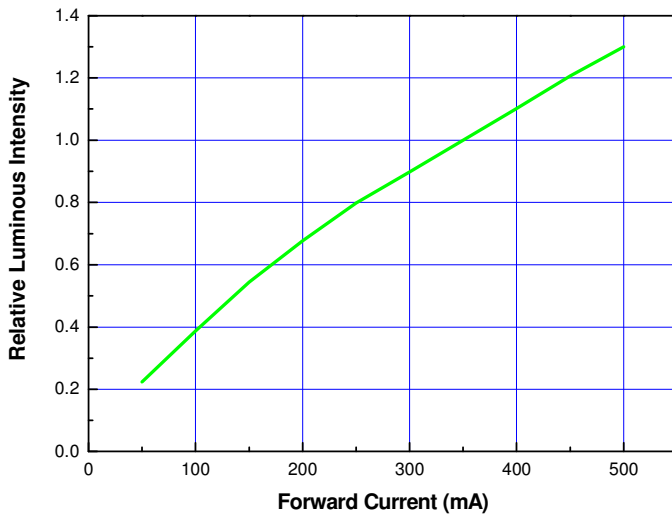
Relative Spectral Distribution,  
 $I_f=350\text{mA}$ ,  $T_{\text{Ambient}}=25^\circ\text{C}$



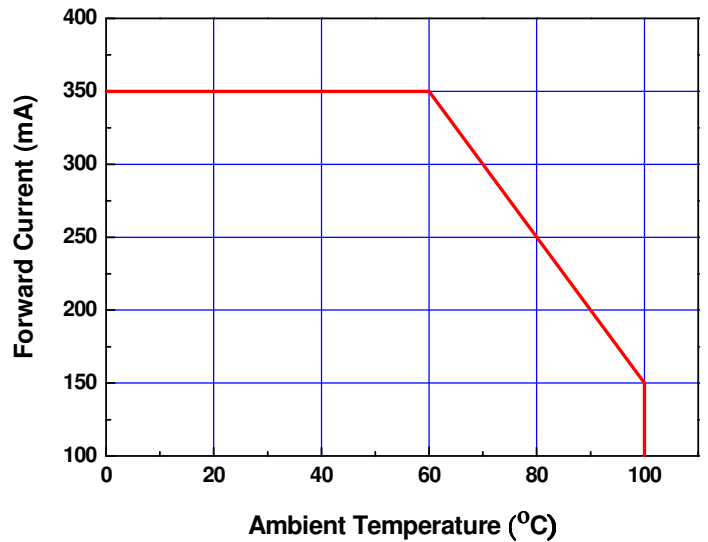
Forward Voltage vs Forward Current,  
 $T_{\text{Ambient}}=25^\circ\text{C}$



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

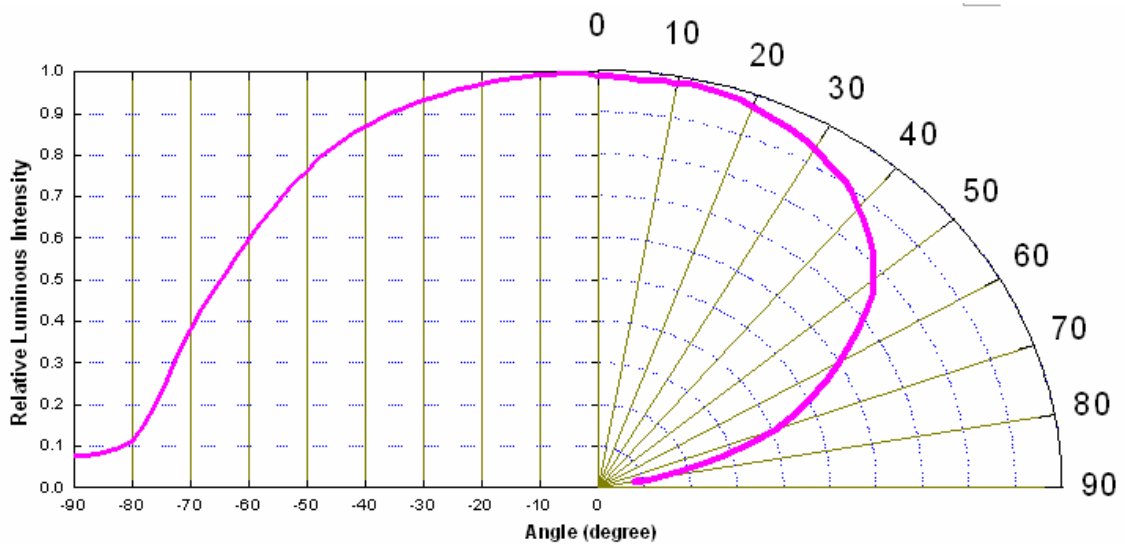


Forward Current Derating Curve,  
Derating based on  $T_{\text{JMAX}}=125^\circ\text{C}$



EHP-A08L-HA/SUG01-P01

Typical Representative Spatial Radiation Pattern



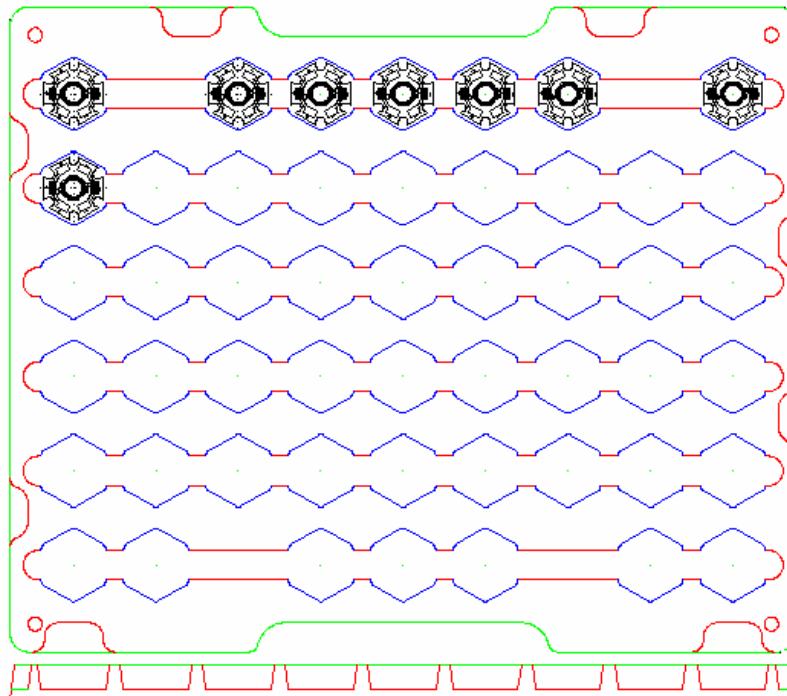
EHP-AX08L-HA/SUG01-P01

Label explanation

- CPN: Customer's Production Number
- P/N : Production Number
- QTY: Packing Quantity
- CAT: Ranks
- HUE: Peak Wavelength
- REF: Reference
- LOT No: Lot Number
- MADE IN TAIWAN: Production Place

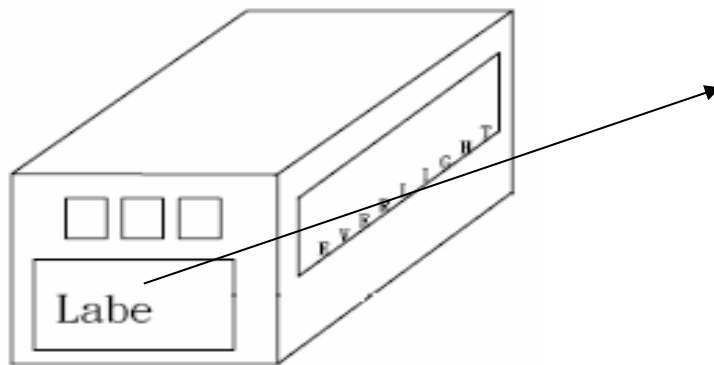


Carrier Tray Dimensions: Loaded quantity 50 PCS per tray.



**EHP-AX08L-HA/SUG01-P01**

2.Outside Carton



● **Packing Quantity**

- 1. 50 Pcs / Per Tray
- 2. 10 Tray / Inner Carton

**Reliability Test Items and Results**
**1. LED Component**

| 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.<br>↓ 10sec.<br>'L : - 40°C 20min.                        | 500 Cycles      |
| Temperature Cycle                      | H : +100°C 30min.<br>↓ 5min.<br>'L : - 40°C 30min.                         | 1000 Cycles     |
| High Temperature/Humidity Reverse Bias | Ta=85°C , RH=85%   | 1000hours       |
| High Temperature Storage               | Ta=110°C   | 1000hours       |
| Low Temperature Storage                | Ta=-40°C   | 1000hours       |
| Intermittent operational Life          | Ta=25°C, IF=1000mA<br>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.<br>↓ 5min.<br>'L : - 40°C 15min.<br>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         |



**2. LED with heatsink**

| Stress Test Item               | Stress Condition                 |  |
|--------------------------------|----------------------------------|--|
| Mechanical Shock Test          | Pulse Shape                      | Half-sine waveform                               |
|                                | Impact acceleration              | 1500 g   |
|                                | Pulse duration                   | 0.5 ms   |
|                                | Number of shock                  | Five shock for each of six face( total 30 shock) |
| Vibration Test I               | Vibration waveform               | Sine waveform                                    |
|                                | Vibration frequency/Displacement | 20~80 Hz / 1.52 mm                               |
|                                | Vibration frequency/Acceleration | 80~2000 Hz / 20g                                 |
|                                | Cycle time                       | 4 min  |
|                                | Number of cycle                  | 3 cycle / axis                                   |
|                                | Vibration axes                   | X,Y and Z axes                                   |
| Vibration Test II              | Vibration waveform               | Random waveform                                  |
|                                | RMS/ Test time                   | 6G,10~2000Hz, 10 min/axis                        |
|                                | Vibration axes                   | X,Y and Z axes                                   |
| Terminal Strength Test ( Pad ) | Weight                           | 1 Lbs.   |
|                                | Hold time                        | 30 sec.  |
| Salt Spray Test                | Temperature                      | 35 °C  |
|                                | Humidity                         | More than 85 % RH                                |
|                                | Salt concentration               | 5 %  |
|                                | Fog(ml/80 cm <sup>2</sup> /hr )  | 1.0~2.0 mm per hour per 80 cm <sup>2</sup>       |
|                                | PH Value                         | 6.5~7.2  |
|                                | Test Time                        | 48 hours   |

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

\*VF: FORWARD VOLTAGE DIFFERENCE < 20%

**Precautions For Use**
**1. Over-current-proof**

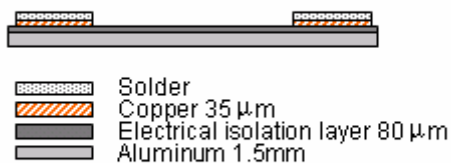
Though EHP-AX08 series has conducted ESD protection mechanism, customer must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause enormous current change and burn out failure would happen.

**2. Storage**

- i. The LEDs should be used within a year.
- ii. Storage should be kept at 30°C or less and 70%RH or less, including opening the package.
- iii. The LEDs should be used within 168 hours (7 days) after opening the package.
- iv. 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 : Pre-curing treatment : 60±5°C for 24 hours.

**3. MCPCB Structure**

- i. For maintaining the high flux output and achieving reliability, EHP-AX08-HA series uses 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 adding heat sink design 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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**EHP-AX08L-HA/SUG01-P01****4. Soldering Iron**

- i. For prototype builds or small series production runs it is possible to place and solder the EHP-AX08 series by hand.
- ii. It is recommended to hand solder the leads with a solder tip temperature of 260°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.
- iii. Be careful because the damage of the product is often started at the time of the hand solder.