

**HLMP-PB00-N0000/HLMP-PM00-N0000**  
**HLMP-QB00-S0000/HLMP-QM00-S0000**  
Subminiature Blue and Green InGaN LED Lamps



## Data Sheet



### Description

#### Flat Top Package

The HLMP-Pxxx flat top lamps use an untinted, nondiffused, truncated lens to provide a wide radiation pattern that is necessary for use in backlighting applications. The flat top lamps are also ideal for use as emitters in light pipe applications.

#### Dome Package

The HLMP-Qxxx dome lamps use an untinted, nondiffused lens to provide a high luminous intensity within a narrow radiation pattern.

### Lead Configurations

All these devices are made by encapsulating LED chip on axial lead frames to form molded epoxy subminiature lamps. A variety of package configuration options is available. These include special surface mount lead configurations, gull wing, yoke lead, or Z-bend. Right angle lead bend at 2.54 mm (0.100 inch) and 5.08 mm (0.200 inch) center spacing are available for through hole mounting. For more information refer to Standard SMT and Through Hole Lead Bend Options for Subminiature Lamps data sheet.

### Features

- Subminiature flat top package  
Ideal for backlighting and light piping applications
- Subminiature dome package  
Nondiffused dome for high brightness
- Colors: 468 nm blue, 525 nm green
- Ideal for space limited applications
- Axial leads
- Available with lead configurations for surface mount and through hole PC board mounting

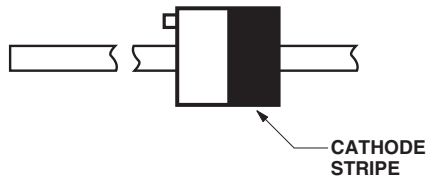
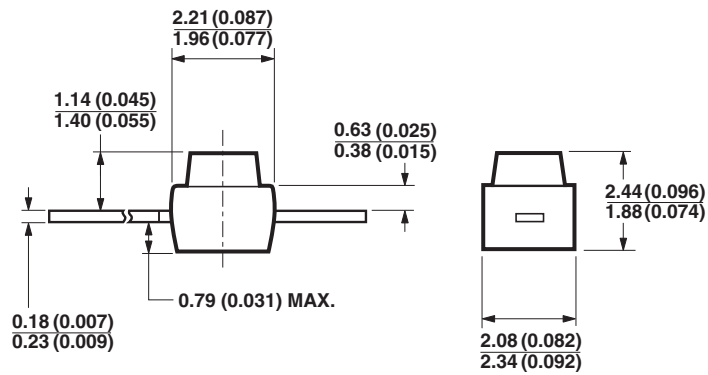
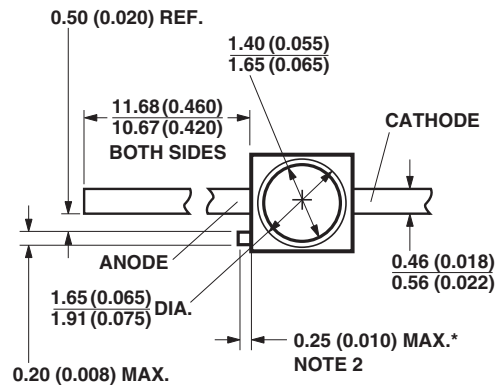
### Applications

- Consumer
- Industrial
- Computer peripheral
- Communication

**CAUTION:** HLMP-xB00 and HLMP-xM00 LEDs are Class 2 ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Avago Application Note AN-1142 for additional details.

## Package Dimensions

### (A) Flat Top Lamps



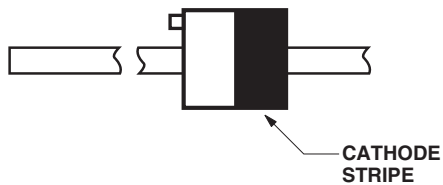
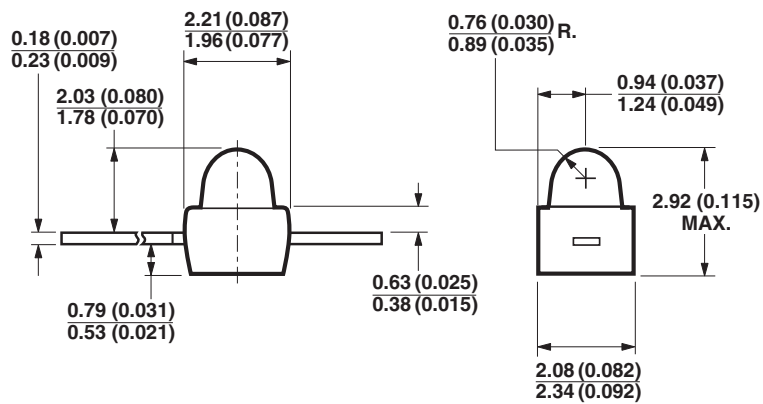
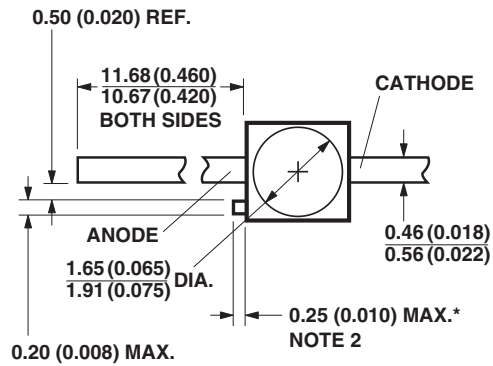
#### NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. PROTRUDING SUPPORT TAB IS CONNECTED TO CATHODE LEAD.

\* REFER TO FIGURE 1 FOR DESIGN CONCERNS.

## Package Dimensions

### B) Domed Lamps



#### NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. PROTRUDING SUPPORT TAB IS CONNECTED TO CATHODE LEAD.

\* REFER TO FIGURE 1 FOR DESIGN CONCERNS.

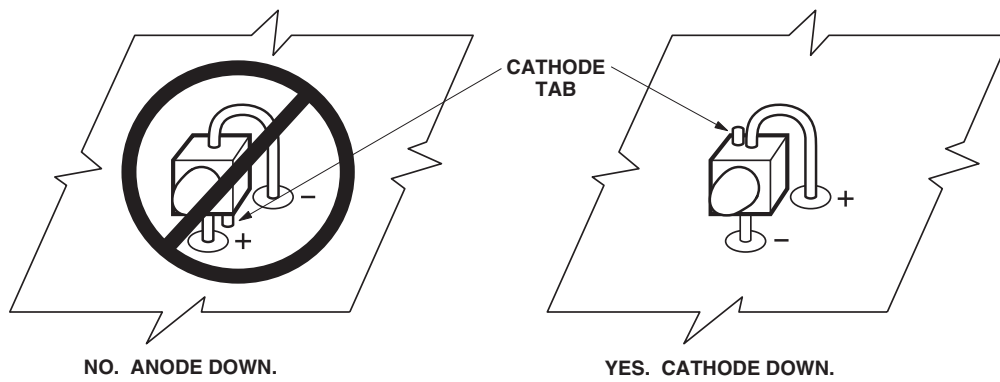
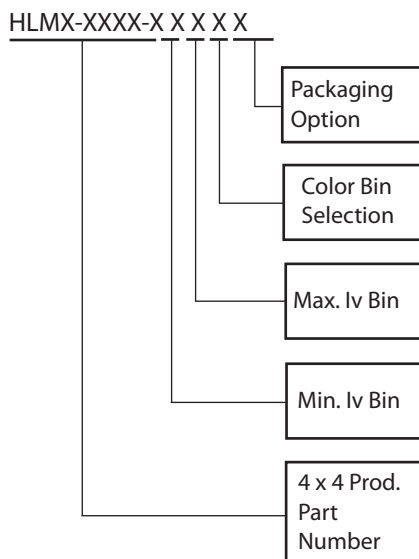


Figure 1. Proper right angle mounting to a PC board to prevent protruding cathode tab from shorting to anode connection.

### Device Selection Guide

| Part Number     | Color | Viewing Angle $2\theta_{1/2}$ | Package Description             | Package Outline |
|-----------------|-------|-------------------------------|---------------------------------|-----------------|
| HLMP-PB00-N0000 | Blue  | 85°                           | Flat Top, Nondiffused, Untinted | A               |
| HLMP-PM00-N0000 | Green |                               |                                 |                 |
| HLMP-QB00-S0000 | Blue  | 12°                           | Domed, Nondiffused, Untinted    | B               |
| HLMP-QM00-S0000 | Green |                               |                                 |                 |

### Ordering Information



**Absolute Maximum Ratings at  $T_A = 25^\circ\text{C}$** 

| Parameter                                                    | Value                                       |
|--------------------------------------------------------------|---------------------------------------------|
| Peak Forward Current                                         | 90 mA                                       |
| DC Forward Current <sup>[1]</sup>                            | 30 mA                                       |
| Power Dissipation                                            | 110 mW                                      |
| Reverse Voltage ( $I_R = 100\ \mu\text{A}$ )                 | 5 V                                         |
| Operating Temperature Range                                  | $-40^\circ\text{C}$ to $+85^\circ\text{C}$  |
| Storage Temperature Range                                    | $-55^\circ\text{C}$ to $+100^\circ\text{C}$ |
| LED Junction Temperature                                     | $110^\circ\text{C}$                         |
| Lead Soldering Temperature<br>[1.6 mm (0.063 in.) from body] | $260^\circ\text{C}$ for 5 seconds           |
| SMT Reflow Soldering Temperature                             | $260^\circ\text{C}$ for 20 seconds          |

**Note:**

1. Derate linearly as shown in Figure 5.

**Optical Characteristics at  $T_A = 25^\circ\text{C}$** 

| Part Number     | Luminous Intensity<br>$I_v$ (mcd) @ $I_F = 20\ \text{mA}$ |      | Color, Peak<br>Wavelength<br>$\lambda_{\text{PEAK}}$ (nm) | Dominant<br>Wavelength<br>$\lambda_d$ (nm) | Spectral<br>Halfwidth<br>$-\lambda_{1/2}$ (nm) | Viewing<br>Angle $2\theta_{1/2}$<br>Degrees | Luminous<br>Efficacy<br>$\eta_v$ (lm/W) |
|-----------------|-----------------------------------------------------------|------|-----------------------------------------------------------|--------------------------------------------|------------------------------------------------|---------------------------------------------|-----------------------------------------|
|                 | Min.                                                      | Typ. | Typ.                                                      | Typ.                                       | Typ.                                           | Typ.                                        |                                         |
| HLMP-PB00-N0000 | 25                                                        | 60   | 470                                                       | 468                                        | 26                                             | 85                                          | 70                                      |
| HLMP-PM00-N0000 | 25                                                        | 200  | 523                                                       | 525                                        | 36                                             | 85                                          | 500                                     |
| HLMP-QB00-S0000 | 160                                                       | 290  | 470                                                       | 468                                        | 26                                             | 12                                          | 70                                      |
| HLMP-QM00-S0000 | 160                                                       | 690  | 523                                                       | 525                                        | 36                                             | 12                                          | 500                                     |

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$** 

| Part Number     | Forward Voltage<br>$V_F$ (Volts) @ $I_F = 20\ \text{mA}$ |      | Reverse Breakdown<br>$V_R$ (Volts) @ $I_R = 100\ \mu\text{A}$ | Capacitance $C$ (pF),<br>$V_F = 0$ , $f = 1\ \text{MHz}$ | Thermal Resistance<br>$R_{\theta J-PIN}$ ( $^\circ\text{C}/\text{W}$ ) |
|-----------------|----------------------------------------------------------|------|---------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------|
|                 | Typ.                                                     | Max. | Min.                                                          | Typ.                                                     | Typ.                                                                   |
| HLMP-PB00-N0000 | 3.7                                                      | 4.1  | 5                                                             | 52                                                       | 170                                                                    |
| HLMP-PM00-N0000 | 3.7                                                      | 4.1  | 5                                                             | 52                                                       | 170                                                                    |
| HLMP-QB00-S0000 | 3.7                                                      | 4.1  | 5                                                             | 52                                                       | 170                                                                    |
| HLMP-QM00-S0000 | 3.7                                                      | 4.1  | 5                                                             | 52                                                       | 170                                                                    |

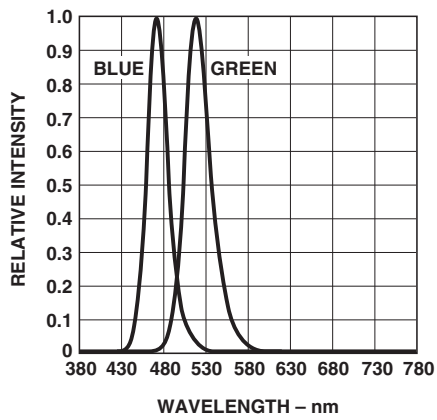


Figure 2. Relative intensity vs. wavelength.

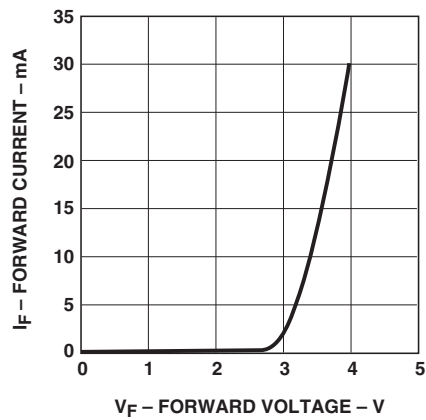


Figure 3. Forward current vs. forward voltage.

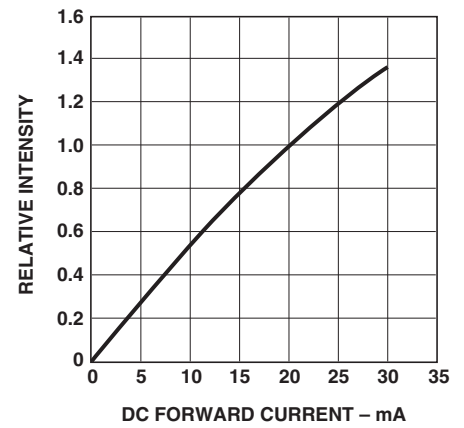


Figure 4. Relative luminous intensity vs. DC forward current.

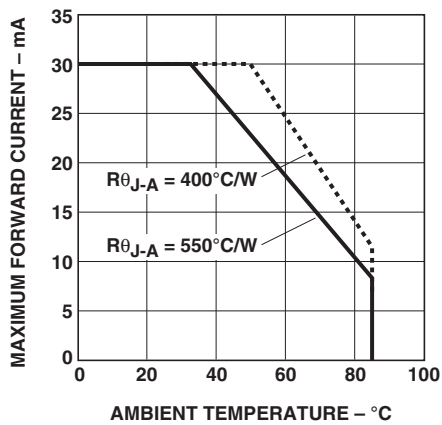


Figure 5. Maximum forward current vs. ambient temperature. Derating based on  $T_{JMAX} = 110\frac{1}{2}^{\circ}C$ .

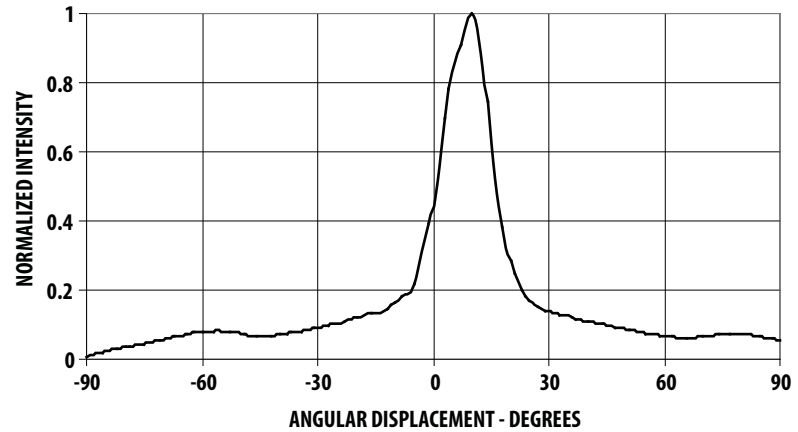


Figure 6. Relative luminous intensity vs. angular displacement for HLMP-Qxxx.

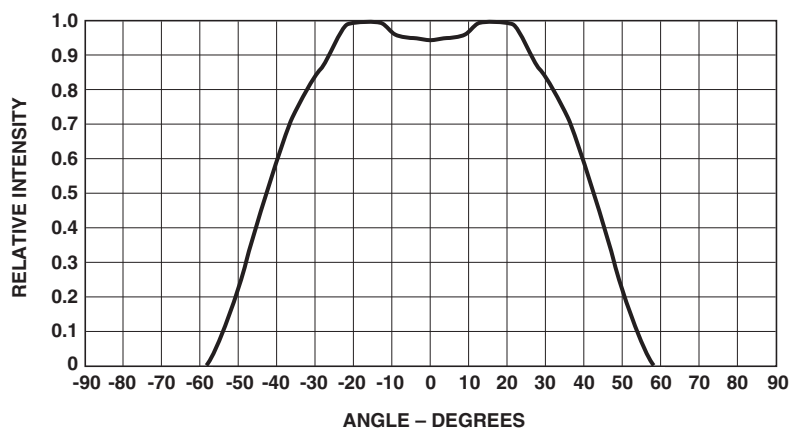


Figure 7. Relative luminous intensity vs. angular displacement for HLMP-Pxxx.

### Intensity Bin limits

| Bin | Min. | Max. |
|-----|------|------|
| N   | 25   | 50   |
| P   | 40   | 80   |
| Q   | 63   | 125  |
| R   | 100  | 200  |
| S   | 160  | 320  |
| T   | 250  | 500  |
| U   | 400  | 800  |
| V   | 630  | 1250 |
| W   | 1000 | 2000 |
| X   | 1600 | 3200 |
| Y   | 2500 | 5000 |

### Color Bin limits

| Package | Bin | Min.              | Max. |
|---------|-----|-------------------|------|
| Blue    | 0   | Full Distribution |      |
|         | 1   | 460               | 464  |
|         | 2   | 464               | 468  |
|         | 3   | 468               | 472  |
|         | 4   | 472               | 476  |
|         | 5   | 476               | 480  |
| Green   | 6   | 480               | 484  |
|         | 0   | Full Distribution |      |
|         | 3   | 520               | 525  |
|         | 4   | 525               | 530  |
|         | 5   | 530               | 535  |
|         | 6   | 535               | 540  |

Tolerance of each bin limit =  $\pm 2$  nm.

### Mechanical Option

|    |                                                                      |
|----|----------------------------------------------------------------------|
| 00 | Straight Leads, Bulk Packaging, Quantity of 500 Parts                |
| 11 | Gull Wing Leads, 12 mm Tape on 7 in. Dia. Reel, 1500 Parts per Reel  |
| 12 | Gull Wing Lead, Bulk Packaging, Quantity of 500 Parts                |
| 14 | Gull Wing Leads, 12 mm Tape on 13 in. Dia. Reel, 6000 Parts per Reel |
| 21 | Yoke Leads, 12 mm Tape on 7 in. Dia. Reel, 1500 Parts per Reel       |
| 22 | Yoke Leads, Bulk Packaging, Quantity of 500 Parts                    |
| 24 | Yoke Leads, 12 mm Tape on 13 in. Dia. Reel, 6000 Parts per Reel      |
| 31 | Z-Bend Leads, 12 mm Tape on 7 in. Dia. Reel, 1500 Parts per Reel     |
| 32 | Z-Bend Leads, Bulk Packaging, Quantity of 500 Parts                  |
| 34 | Z-Bend Leads, 12 mm Tape on 13 in. Dia. Reel, 6000 Parts per Reel    |

**Note:**

All Categories are established for classification of products. Products may not be available in all categories. Please contact your local Avago representative for further clarification/information.

For product information and a complete list of distributors, please go to our website: [www.avagotech.com](http://www.avagotech.com)

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