# 5 mm Standard Oval
Mid Power AlInGaP LEDs

## Data Sheet

### Description

These Precision Optical Performance Oval LEDs are specially designed for full color/video and passenger information signs. The oval shaped radiation pattern and high luminous intensity ensure that these devices are excellent for wide field of view outdoor application where a wide viewing angle and readability in sunlight are essential. These lamps have very smooth, matched radiation patterns ensuring consistent color mixing in full color application, message uniformity across the viewing angle of the sign. High efficiency LED material is used in these lamps: Aluminum Indium Gallium Phosphide (AlInGaP) for amber and red. Each lamp is made with an advance optical grade epoxy offering superior high temperature and high moisture resistance in outdoor applications. The package epoxy contains both UV-A and UV-B inhibitors to reduce the effects of long term exposure to direct sunlight.

### Applications

- Traffic management:
  - Traffic Signals
  - Pedestrian signals
  - Work Zone Warning Lights
  - Variable Message Signs
- Commercial Outdoor advertising
  - Sign
  - Marquees

### Features

- High Luminous Output
- Well defined spatial radiation pattern
- Viewing angles:

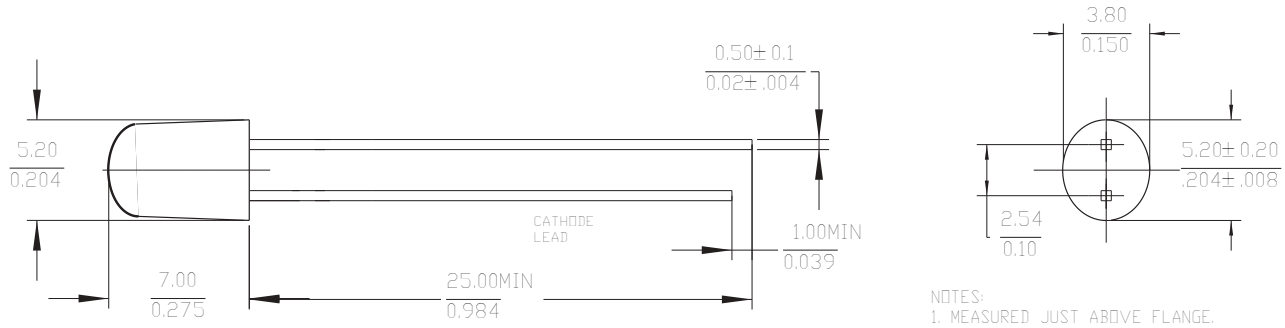
| | 40 x 100 |
|---|---|
| Major axis | 100 |
| Minor axis | 40 |

- Red and Amber Intensity are available for AlInGaP
- Colors:
  - 626 nm red
  - 592 nm amber
- Superior resistance to moisture
- UV resistant epoxy
- Package
  With or Without lead stand-Offs

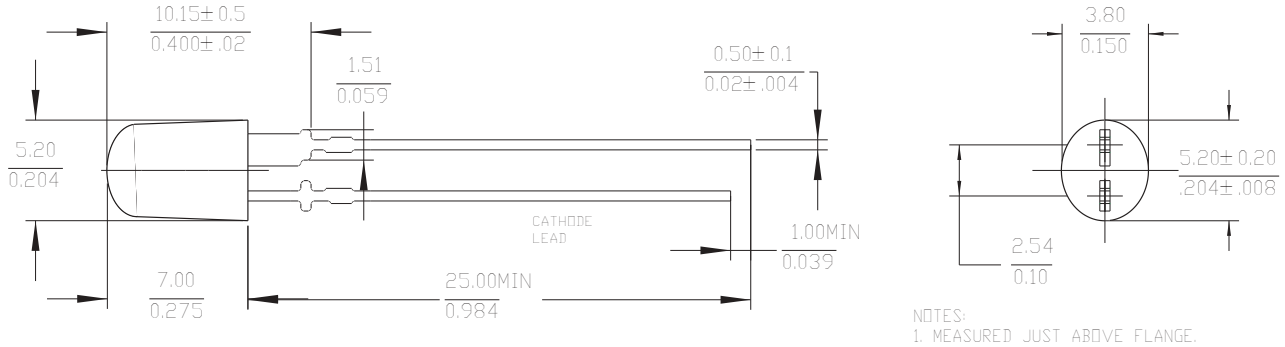
### Benefits

- Viewing Angle match Traffic Management Sign Requirements
- Colors Meet Pedestrian Signal Specifications
- Superior performance In Outdoor and Indoor Environments
- Suitable for Auto-insertion onto PC Boards
- Suitable for high current application which give good sign contrast and reduce the number of LED use in a cluster

### Package Dimensions A




### Package Dimensions B



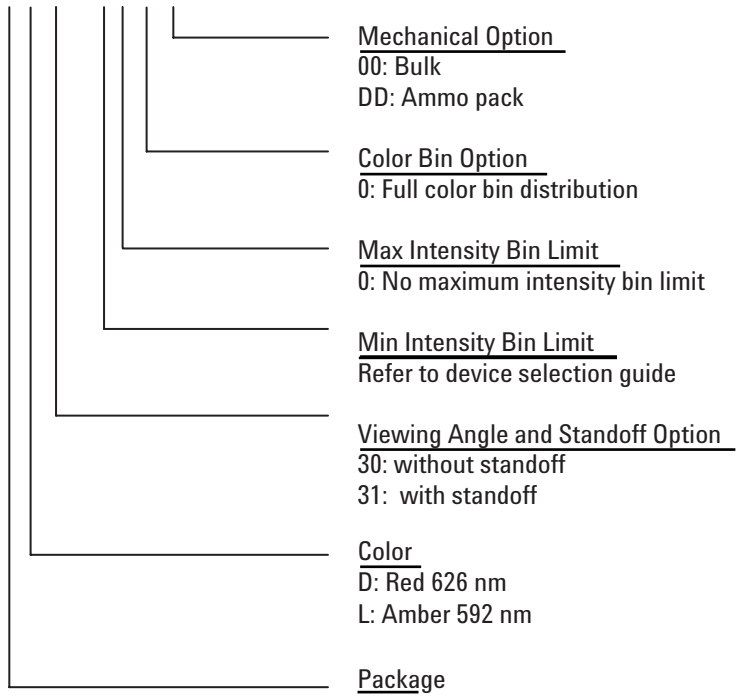

Notes:
1. Dimension in millimeters (inches)
2. Tolerance ± 0.1 mm unless otherwise noted.

| Part Number | Standoff Leads | Color and Dominant Wavelength (nm). Typ. [3] | Luminous Intensity Iv (mcd) [1,2] @70 mA | | | Package Drawing |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| HLMP-HD30-SV000 | No | Red/626 | 1900 | 3309 | 5500 | A |
| HLMP-HD31- SV000 | Yes | Red/626 | 1900 | 3309 | 5500 | B |
| HLMP-HL30-RU000 | No | Amber/592 | 1500 | 2521 | 4200 | A |
| HLMP-HL31- RU000 | Yes | Amber/592 | 1500 | 2521 | 4200 | B |

Notes:
1. The luminous Intensity is measured on the axis of the lamps packages.
2. The optical axis is closely aligned with the package mechanical axis.
3. The dominant wavelength, $\lambda_{d,}$ is derive from the CIE Chromaticity Diagram and represents the color of the lamps.
4. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is one half the on-axis intensity.

**Part Numbering System**

HLMP – x x xx - x x x xx



Mechanical Option
00: Bulk
DD: Ammo pack

Color Bin Option
0: Full color bin distribution

Max Intensity Bin Limit
0: No maximum intensity bin limit

Min Intensity Bin Limit
Refer to device selection guide

Viewing Angle and Standoff Option
30: without standoff
31: with standoff

Color
D: Red 626 nm
L: Amber 592 nm

Package
H: 5 mm 40 x 100 Oval Parallel

**Absolute Maximum Rating**
**TA = 25°C**

| Parameters | Value |
|---|---|
| DC forward current [1] | 70 mA |
| Peak pulsed forward current | 100 mA |
| Average forward current | 70 mA |
| Reverse voltage (Ir = 100 A) | 5 V |
| LED junction temperature | 130 C |
| Operating temperature | -40 C to +100 C |
| Storage temperature | -40 C to +120 C |
| Wave soldering temperature [2] | 250 C for 3 seconds |
| Solder Dipping Temperature [2] | 260°C for 5 seconds |

Note:
1. Derate linearly as shown in figure 4.
2. 1.59 mm (0.060 in.) below body

**Electrical and Optical Characteristics at TA=25°C**

| Parameters | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|
| Forward voltage | | | | V | $I_F$ = 70 mA |
| Amber (λd=592 nm) | | 2.10 | 2.45 | | |
| Red (λd=626 nm) | | 2.84 | 3.25 | | |
| Reverse voltage | 5 | 20 | | V | $I_F$ = 100 µA |
| Peak Wavelength: | | | | | |
| Amber (λd=592 nm) | | 595 | | nm | $I_F$ = 70 mA |
| Red (λd=626 nm) | | 638 | | | |
| Spectral Halfwidth | | | | | |
| Amber (λd=592 nm) | | 16 | | nm | $I_F$ = 70 mA |
| Red (λd=626 nm) | | 20 | | | |
| Capacitance | | | | | |
| Amber (λd=592 nm) | | 17 | | pF | $V_F$ =0, |
| Red (λd=626 nm) | | 34 | | | f=1 MHz |
| Thermal Resistance | | 130 | | C/W | LED Junction to cathode |
| Luminous Efficacy [1] | | | | | |
| Amber (λd=592 nm) | | 800 | | lm/W | Emitted Luminous |
| Red (λd=626nm) | | 970 | | | Power/ Emitted Radiant power |

Note:

1. The radiant intensity, Ie in watts per steradian, may be found from the equation Ie=Iv/$h_v$, where Iv is the luminous intensity in candelas and $h_v$ $i_i$s the luminous efficacy in lumens/watt.

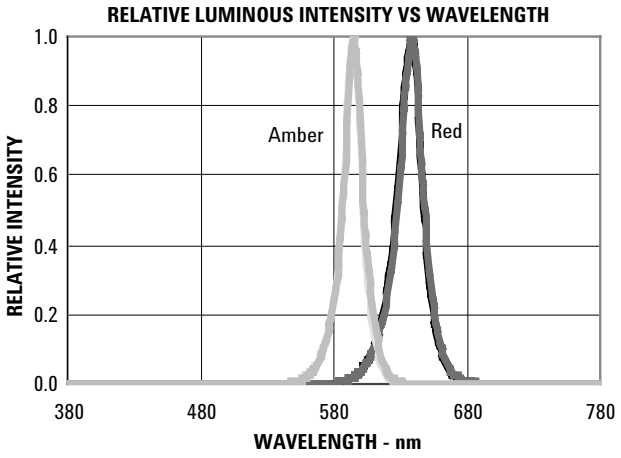



**Figure 1. Relative Intensity vs. Wavelength**

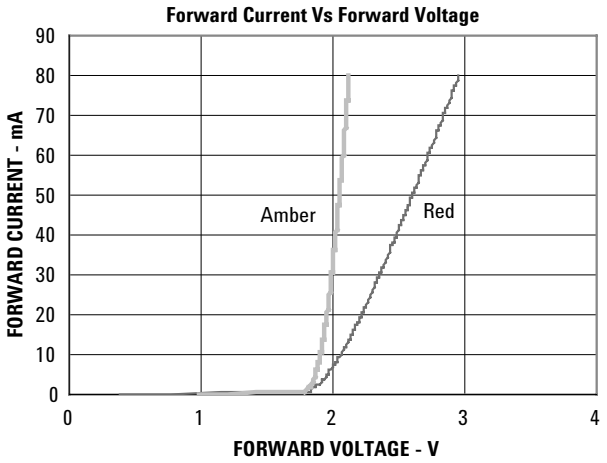



**Figure 2. Forward Current vs. Forward Voltage**

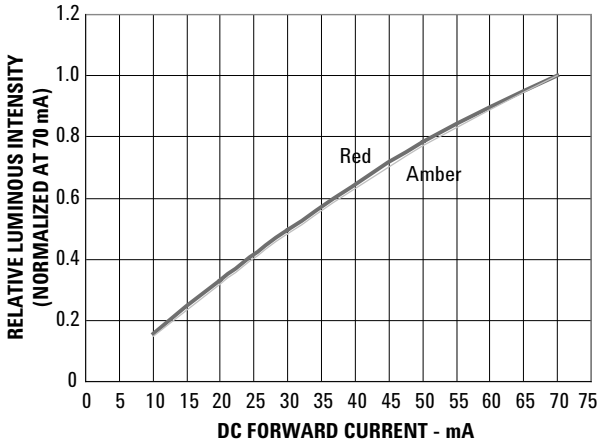



**Figure 3. Relative Luminous Intensity vs. Forward Current**

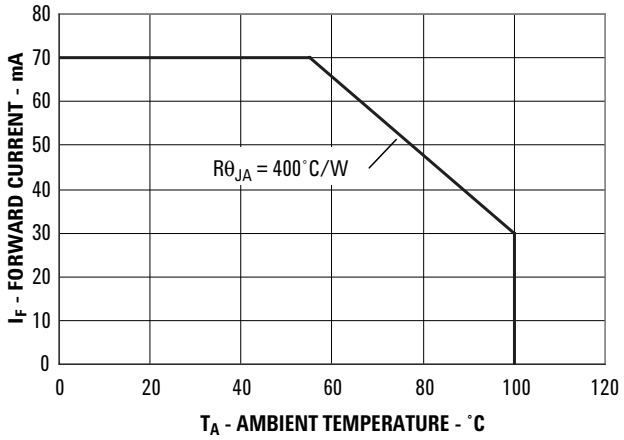



**Figure 4. Maximum Forward Current vs Ambient Temperature. Derating Based on $T_{JMAX}$=130°C.**

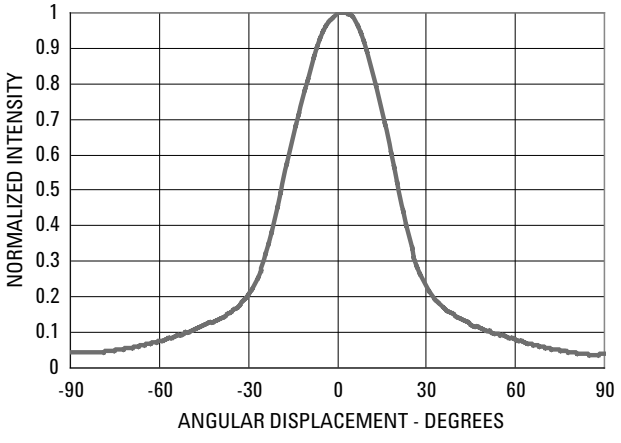



**Figure 5. Representative Spatial Radiation Pattern of the — minor axis**

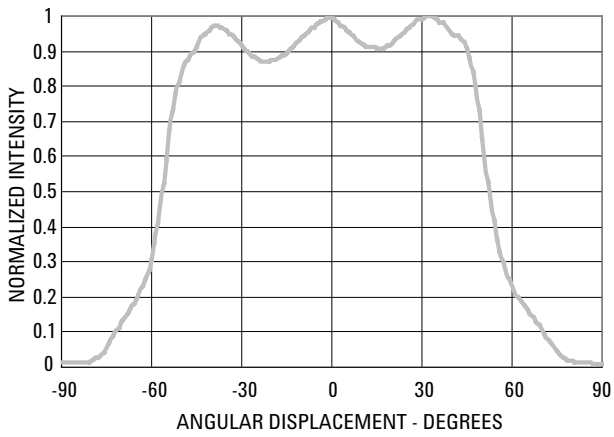



**Figure 6. Representative Spatial Radiation Pattern for — major axis**

**Intensity Bin Limits (mcd at 70 mA)**

| Bin Name | Min. | Max. |
|---|---|---|
| S | 1900 | 2500 |
| T | 2500 | 3200 |
| U | 3200 | 4200 |
| V | 4200 | 5500 |
| W | 5500 | 7200 |
| X | 7200 | 9300 |

Tolerance for each bin limits is ±15%

**Amber color Bin Limits (nm at 70 mA)**

| Bin Name | Min. | Max. | Corner Point | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| 1 | 584.5 | 587.0 | x | 0.542 | 0.537 | 0.553 | 0.557 |
| | | | y | 0.458 | 0.455 | 0.440 | 0.442 |
| 2 | 587.0 | 589.5 | x | 0.557 | 0.553 | 0.567 | 0.572 |
| | | | y | 0.442 | 0.440 | 0.425 | 0.427 |
| 4 | 589.5 | 592.0 | x | 0.572 | 0.567 | 0.582 | 0.587 |
| | | | y | 0.427 | 0425 | 0.411 | 0.413 |
| 6 | 592.0 | 594.5 | x | 0.587 | 0.582 | 0.595 | 0.600 |
| | | | y | 0.413 | 0.411 | 0.398 | 0.399 |

Tolerance for each bin limits is ±0.5nm

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**


5989-3989EN - May 9, 2006