# HLMA-SH05

2 mm x 5 mm Rectangular
AlInGaP Lamps

## Data Sheet



### Description

The HLMA-SH05 is an epoxy encapsulated lamp in rectangular package which are easily stacked in arrays or used for discrete front panel indicators. Contrast and light uniformity are enhanced by a special epoxy diffusion and tinting process.

### Technology

This 2x5 rectangular solid state lamp utilizes the newly developed Aluminum Indium Gallium Phosphide (AlInGaP) LED technology. This material has a very high luminous efficiency, capable of producing high light output over a wide range of drive currents.

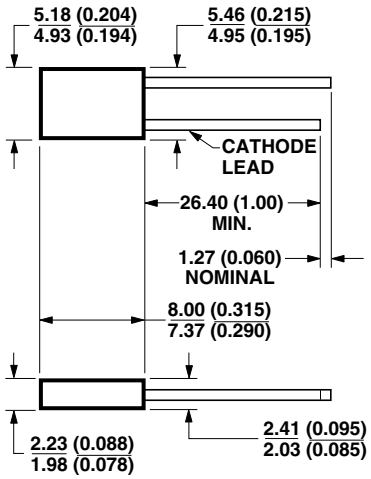
### Device Selection Guide

| Package Description | Viewing Angle $2\theta_{1/2}$ | Dominant Wavelength |
|---|---|---|
| Rectangular, 2mm x 5 mm, Tinted, Diffused | 110 | 615 nm |

### Features

- Rectangular light emitting surface
- Excellent for flush mounting on panels
- Long life: solid state reliability
- Excellent uniformity of light output

### Package Dimensions




NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. AN EPOXY MENISCUS MAY EXTEND ABOUT 1 mm (0.040") DOWN THE LEADS.
3. THERE IS A MAXIMUM 1° TAPER FROM BASE TO THE TOP OF LAMP.

## Absolute Maximum Ratings

| **DC Forward Current[1]** | **50 mA** |
|---|---|
| Peak Forward Current[2] | 200 mA |
| Average Forward Current (at $I_{PEAK}$ = 200 mA, f ≥ 1 KHz)[2] | 45 mA |
| Transient Forward Current[3] (10 μs Pulse) | 500 mA |
| Reverse Voltage ($I_R$ = 100 μA) | 5 V |
| LED Junction Temperature | 110°C |
| Operating Temperature Range | -40 to +100°C |
| Storage Temperature Range | -40 to +100°C |
| Wave Soldering Temperature (1.59 mm [0.063 in] below Body) | 250°C for 3 seconds |
| Solder Dipping Temperature (1.59 mm [0.063 in] below Body) | 260°C for 5 seconds |

Notes:
1. Derate linearly as shown in Figure 4.
2. Refer to Figure 5 to establish pulsed operating conditions.
3. The transient peak current is the maximum non-recurring peak current the device can withstand without damaging the LED die and wire bonds.

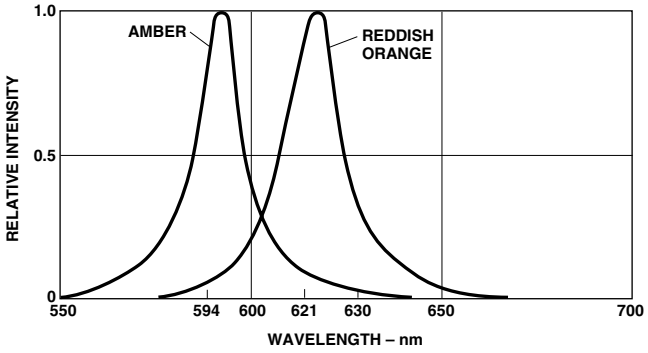



**Figure 1. Relative intensity vs. wavelength.**

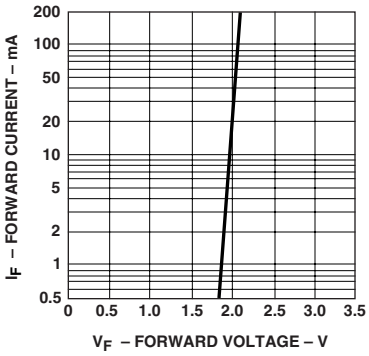



**Figure 2. Forward current vs. forward voltage.**

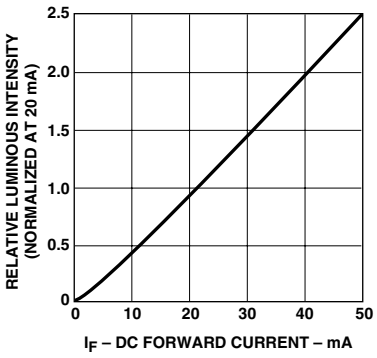



**Figure 3. Relative luminous intensity vs. foward current.**

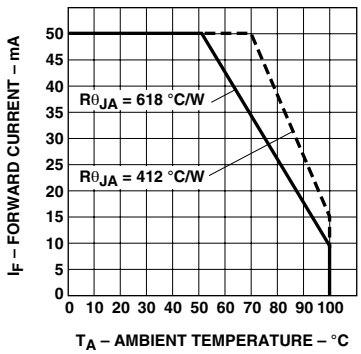



**Figure 4. Maximum forward current vs. ambient temperature. Derating based on T Max = 110°C.**

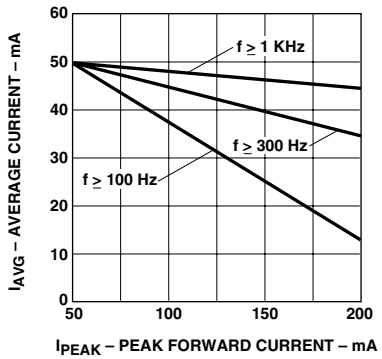



**Figure 5. Maximum average current vs. peak foward current.**

## Optical Characteristics at $T_A = 25°C$

| Part Number HLMA- | Luminous Intensity IV (mcd) @ 20 mA Min. | Typ. | Peak Wavelength $\lambda_{peak}$ (nm) Typ. | Color, Dominant Wavelength $\lambda_d$[1] (nm) Typ. | Viewing Angle $2\theta_{1/2}$ Degrees[2] Typ. | Luminous Efficacy $\eta_v$ (lm/w) |
|---|---|---|---|---|---|---|
| SH05 | 8 | 20 | 621 | 615 | 110 | 263 |

Notes:
1. The dominant wavelength, ld, is derived from the CIE Chromaticity Diagram and represents the color of the device.
2. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is 1/2 the peak intensity.

## Electrical Characteristics at $T_A = 25°C$

| Part Number HLMA- | Forward Voltage $V_F$ (Volts) @ $I_F = 20$ mA Min. | Typ. | Reverse Breakdown $V_R$ (Volts) @ $I_R = 100$ µA Min. | Typ. | Capacitance C (pF) $V_F = 0$, f = 1 MHz Typ. | Thermal Resistance $R\theta_{J\text{-}PIN}$ (°C/W) | Speed of Response $\tau s$ (ns) Time Constant $e^{-t/\tau_s}$ Typ. |
|---|---|---|---|---|---|---|---|
| SH05 | 1.9 | 2.4 | 5 | 20 | 40 | 260 | 13 |

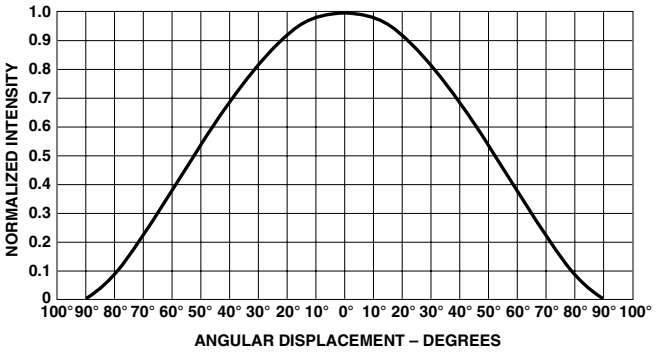



**Figure 6.**

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

Avago, Avago Technologies, and the A logo are trademarks of Avago Technologies in the United States and other countries.
Data subject to change. Copyright © 2005-2008 Avago Technologies. All rights reserved.
AV02-1553EN - September 25, 2008