

T-1³/₄ (5 mm) AlInGaP Lamps

Technical Data

HLMP-Cx08 Series
HLMP-Cx25 Series
HLMP-Cx27 Series
HLMP-C610

Features

- High Intensity
- General Purpose Leads
- Popular 5 mm Diameter
- Available in Bulk, Tape and Reel, or Ammopack
- 8° or 25° Viewing Angles
- Choice of Colors: Amber or Red

- Spoiler, Car Decorative Lighting
- Motorcycle/Bicycle Warning Lights

Description

The HLMP-Cx08, HLMP-Cx25, HLMP-Cx27, and HLMP-C610 series are 5 mm lamps specially designed for applications requiring very high on-axis intensity that is not achievable with a standard lamp. These devices are capable of producing light output over a wide range of drive currents.

Built using AlInGaP technology, they are well suited for typical 5 mm TS-AlGaAs lamp applica-



tions, and have significantly SUPERIOR RELIABILITY than most TS-AlGaAs lamps in wet/hot environments. These lamps come with clear non-diffused lens and are optically designed to yield superior light output.

Applications

- Indoor/Outdoor Applications
- Small Store-front Signs
- Message Panels
- Road Construction Barrier Lights
- Center High Mount Stop Lights

Device Selection

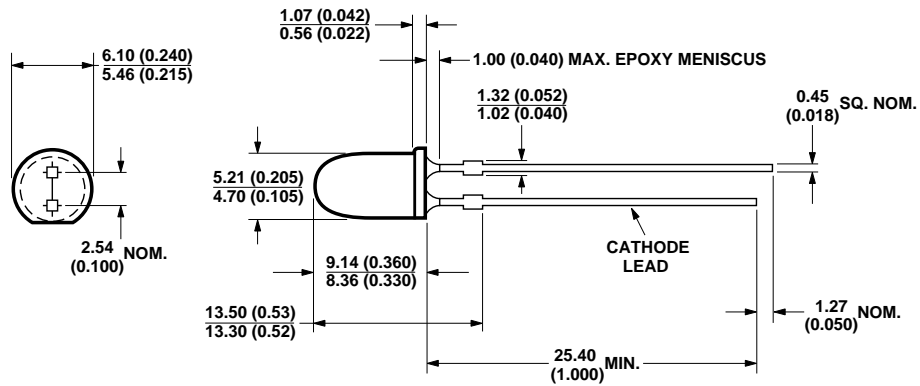
| Part Number | Standoff | Typical Viewing Angle ^[1] (degrees), 2θ ^{1/2} | Luminous Intensity, I _v (mcd) @ 20 mA | | Color | Dominant Wavelength ^[2] |
|-----------------|----------|---|--|--------|-------|------------------------------------|
| | | | Min. | Typ. | | |
| HLMP-C008-U00xx | No | 8 | 2900.0 | 6000.0 | Red | 626 |
| HLMP-C208-S00xx | | 8 | 2600.0 | 3000.0 | Amber | 590 |
| HLMP-C608-R00xx | | 8 | 1000.0 | 2000.0 | Red | 635 |
| HLMP-C610-R00xx | Yes | 8 | 1000.0 | 2000.0 | Red | 635 |
| HLMP-C025-P00xx | No | 25 | 500.0 | 1000.0 | Red | 626 |
| HLMP-C225-O00xx | | 25 | 450.0 | 800.0 | Amber | 590 |
| HLMP-C625-P00xx | | 25 | 500.0 | 700.0 | Red | 635 |
| HLMP-C027-P00xx | Yes | 25 | 500.0 | 1000.0 | Red | 626 |
| HLMP-C627-P00xx | | 25 | 500.0 | 700.0 | Red | 635 |

Notes:

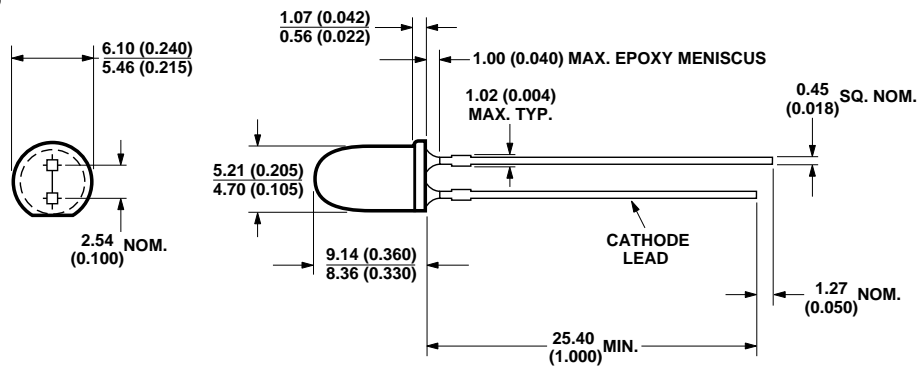
1. θ^{1/2} is the off-axis angle at which the luminous intensity is half of the axial luminous intensity.
2. The dominant wavelength, λ_d, is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Package Dimensions

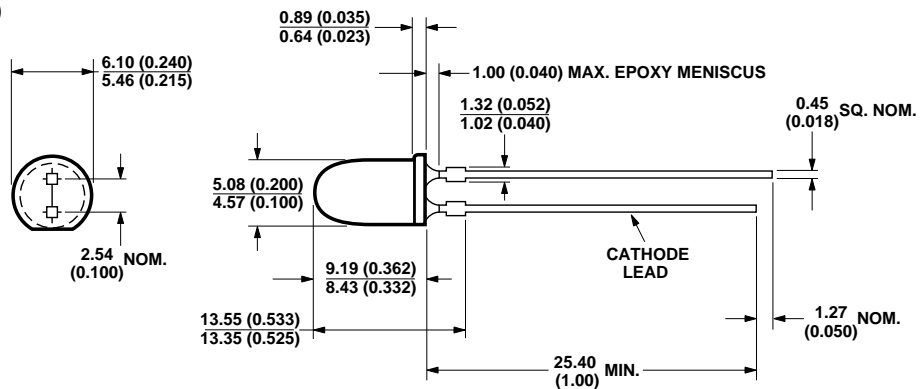
HLMP-Cx27



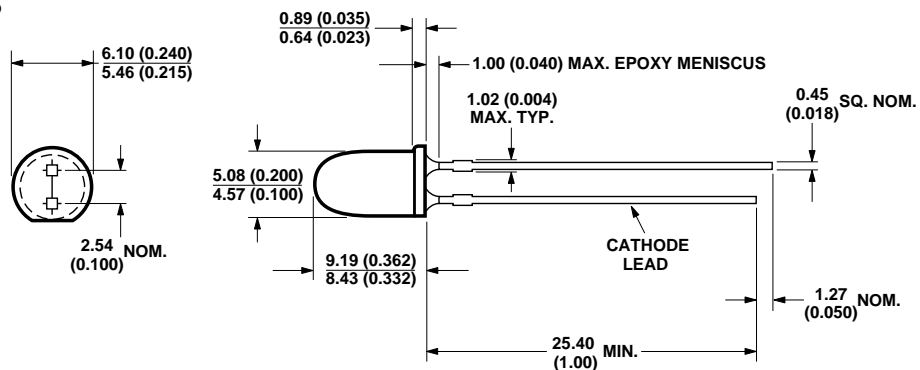
HLMP-Cx25



HLMP-C610

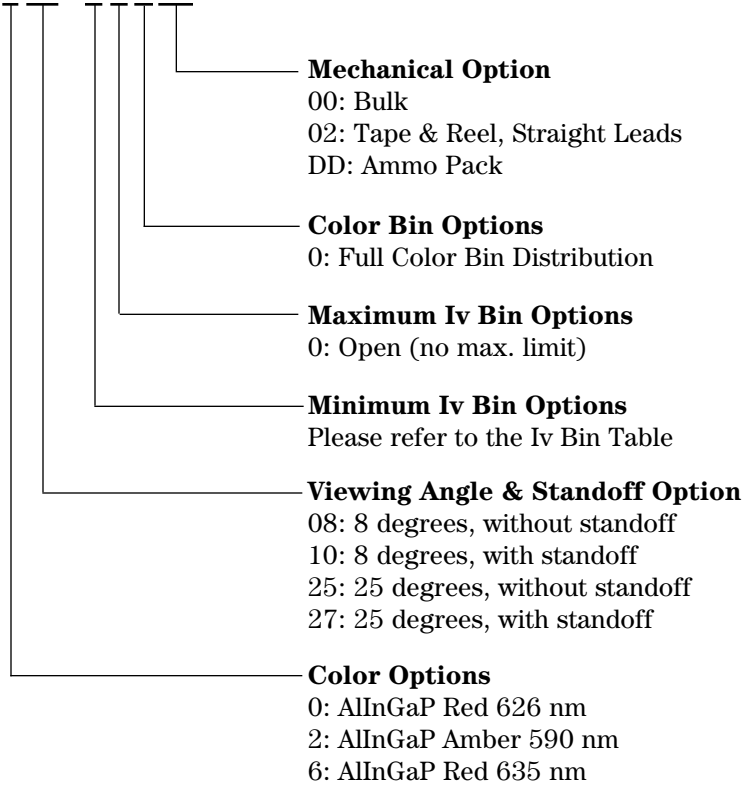


HLMP-Cx08



Part Numbering System

HLMP - C x xx - x x x xx



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

| Parameter | Absolute Maximum | Units |
|---|------------------------------------|------------------|
| Peak Forward Current | 70 | mA |
| Average Forward Current ^[1] | 30 | mA |
| DC Current ^[2] | 50 | mA |
| Reverse Voltage ($I_R = 100 \mu\text{A}$) | 5 | V |
| LED Junction Temperature | 110 | $^\circ\text{C}$ |
| Operating Temperature | -40 to +100 | $^\circ\text{C}$ |
| Storage Temperature | -40 to +120 | |
| Lead Soldering Temperature [1.59 mm (0.060 in.) below seating plane] | 260 $^\circ\text{C}$ for 5 seconds | |

Notes:

- See Figure 2 to establish pulsed operating conditions.
- Derate linearly from 50 $^\circ\text{C}$ at 0.5 mA/ $^\circ\text{C}$.
- The transient peak current is the maximum non-recurring peak current that can be applied to the device without damaging the LED die and wirebond. It is not recommended that this device be operated at peak currents above the Absolute Maximum Peak Forward Current.

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

| Symbol | Parameter | Device | Min. | Typ. ^[3] | Max. | Units | Test Conditions |
|--------------------------|--|---|------|---|---|--------------------|------------------------------------|
| $2\theta^{1/2}$ | Included Angle Between Half Luminous Intensity Points ^[1] | HLMP-C008 HLMP-C208 HLMP-C608 HLMP-C025 HLMP-C225 HLMP-C625 HLMP-C610 HLMP-C027 HLMP-C627 | | 8 8 8 25 25 25 8 25 25 | | Deg. | $I_F = 20\text{ mA}$ See Note 1 |
| λ_d | Dominant Wavelength ^[2] | HLMP-C008 HLMP-C208 HLMP-C608 HLMP-C025 HLMP-C225 HLMP-C625 HLMP-C610 HLMP-C027 HLMP-C627 | | 626 590 635 626 590 635 635 626 635 | | nm | See Note 2 |
| λ_{PEAK} | Peak Wavelength | HLMP-C008 HLMP-C208 HLMP-C608 HLMP-C025 HLMP-C225 HLMP-C625 HLMP-C610 HLMP-C027 HLMP-C627 | | 635 594 650 635 594 650 650 635 650 | | nm | Measurement at Peak |
| $\Delta\lambda^{1/2}$ | Spectral Line Halfwidth | | | 17 | | nm | |
| τ_s | Speed of Response | | | 20 | | ns | |
| C | Capacitance | | | 40 | | pF | $V_F = 0;$ $f = 1\text{ MHz}$ |
| $R\theta_{\text{J-PIN}}$ | Thermal Resistance | | | 260 | | $^\circ\text{C/W}$ | Junction to Cathode Lead |
| V_F | Forward Voltage | HLMP-C008 HLMP-C208 HLMP-C608 HLMP-C025 HLMP-C225 HLMP-C625 HLMP-C610 HLMP-C027 HLMP-C627 | | 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 | 2.4 2.6 2.2 2.4 2.6 2.2 2.2 2.4 2.2 | V | $I_F = 20\text{ mA}$ |
| V_R | Reverse Breakdown Voltage | | 5.0 | | | V | $I_R = 100\ \mu\text{A}$ |

Notes:

- $\theta^{1/2}$ is the off-axis angle at which the luminous intensity is half of the axial luminous intensity.
- The dominant wavelength, λ_d , is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
- Typical specification for reference only. Do not exceed absolute maximum ratings.

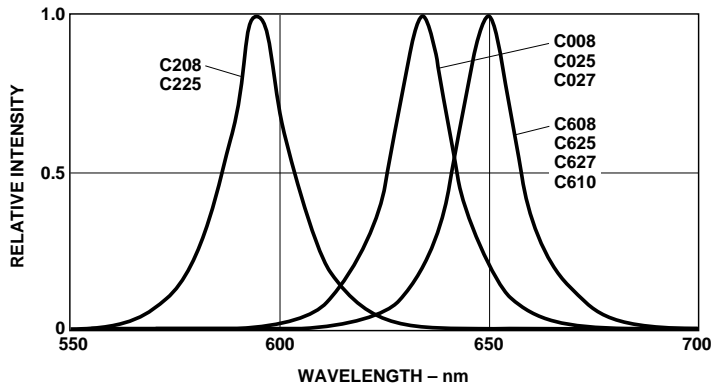


Figure 1. Relative Intensity vs. Wavelength.

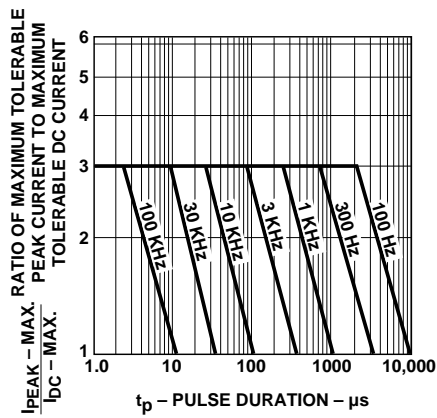


Figure 2. Maximum Tolerable Peak Current vs. Pulse Duration.

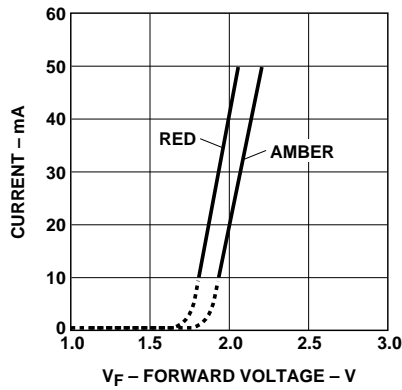


Figure 3. Forward Current vs. Forward Voltage.

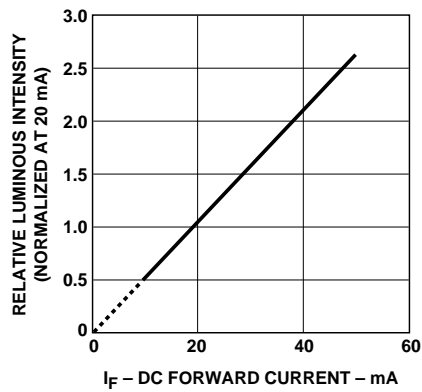


Figure 4. Relative Luminous Intensity vs. Forward Current.

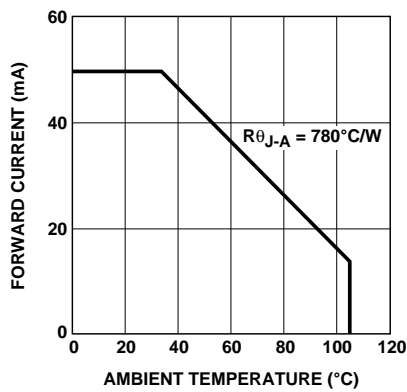


Figure 5. Maximum Forward DC Current vs. Ambient Temperature.

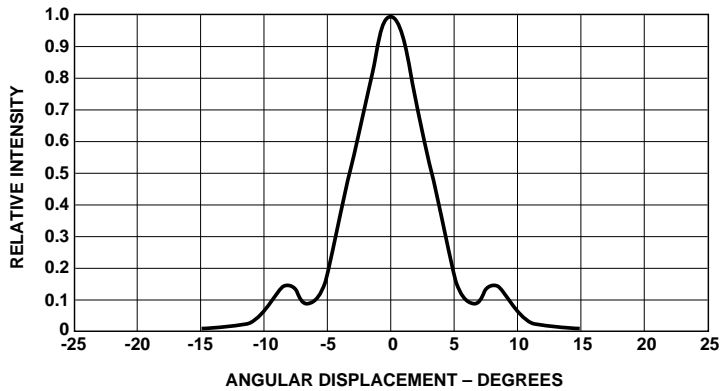


Figure 6. Relative Luminous Intensity vs. Angular Displacement for HLMP-Cx08 and HLMP-Cx10.

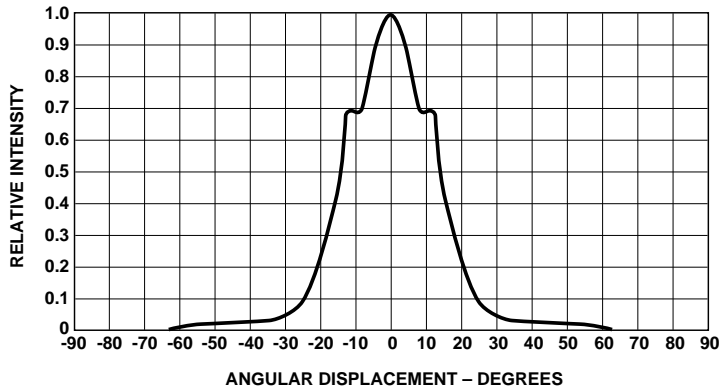


Figure 7. Relative Luminous Intensity vs. Angular Displacement for HLMP-Cx25 and HLMP-Cx27.

Soldering/Cleaning

Cleaning agents from the ketone family (acetone, methyl ethyl ketone, etc.) and from the chlorinated hydrocarbon family (methylene chloride, trichloroethylene, carbon tetrachloride, etc.) are not recommended for cleaning LED parts. All of these various solvents attack or dissolve the encapsulating epoxies used to form the package of plastic LED parts.

For information on soldering LEDs, please refer to Application Note 1027.

Intensity Bin Limits

| Color | Bin | Intensity Range (mcd) | |
|--------|---------|-----------------------|---------|
| | | Min. | Max. |
| Red | P | 540.0 | 850.0 |
| | Q | 850.0 | 1200.0 |
| | R | 1200.0 | 1700.0 |
| | S | 1700.0 | 2400.0 |
| | T | 2400.0 | 3400.0 |
| | U | 3400.0 | 4900.0 |
| | V | 4900.0 | 7100.0 |
| | W | 7100.0 | 10200.0 |
| | X | 10200.0 | 14800.0 |
| | Y | 14800.0 | 21400.0 |
| Z | 21400.0 | 30900.0 | |
| Yellow | O | 510.0 | 800.0 |
| | P | 800.0 | 1250.0 |
| | Q | 1250.0 | 1800.0 |
| | R | 1800.0 | 2900.0 |
| | S | 2900.0 | 4700.0 |
| | T | 4700.0 | 7200.0 |
| | U | 7200.0 | 11700.0 |
| | V | 11700.0 | 18000.0 |
| W | 18000.0 | 27000.0 | |

Maximum tolerance for each bin limit is $\pm 18\%$.

Color Categories

| Color | Category # | Lambda (nm) | |
|-------|------------|-------------|-------|
| | | Min. | Max. |
| Amber | 3 | 584.5 | 587.0 |
| | 2 | 587.0 | 589.5 |
| | 4 | 589.5 | 592.0 |
| | 6 | 592.0 | 594.5 |
| | 7 | 594.5 | 597.0 |

Tolerance for each bin limit is ± 0.5 nm.

Mechanical Option Matrix

| Mechanical Option Code | Definition |
|------------------------|---|
| 00 | Bulk Packaging, minimum increment 500 pcs/bag |
| 02 | Tape & Reel, straight leads, minimum increment 1300 pcs/bag |
| DD | Ammo Pack, straight leads with minimum increment 2K/pack |

Note:

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

www.agilent.com/semiconductors

For product information and a complete list of distributors, please go to our web site.

For technical assistance call:

Americas/Canada: +1 (800) 235-0312 or
(916) 788-6763

Europe: +49 (0) 6441 92460

China: 10800 650 0017

Hong Kong: (+65) 6756 2394

India, Australia, New Zealand: (+65) 6755 1939

Japan: (+81 3) 3335-8152 (Domestic/International), or 0120-61-1280 (Domestic Only)

Korea: (+65) 6755 1989

Singapore, Malaysia, Vietnam, Thailand,
Philippines, Indonesia: (+65) 6755 2044

Taiwan: (+65) 6755 1843

Data subject to change.

Copyright © 2003 Agilent Technologies, Inc.

Obsoletes 5988-2231EN

May 30, 2003

5988-9482EN