

2.5 mm x 7.6 mm Rectangular LED Lamps

Technical Data

HLMP-R100
HLMP-0300/0301
HLMP-0400/0401
HLMP-0503/0504

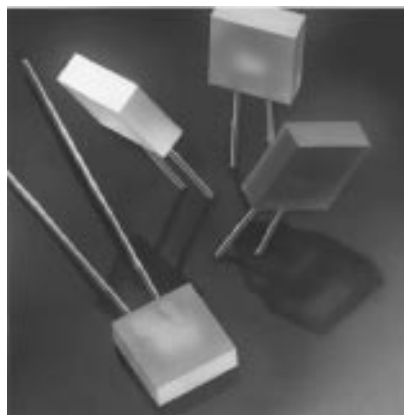
Features

- **Rectangular Light Emitting Surface**
- **Flat High Sterance Emitting Surface**
- **Stackable on 2.54 mm (0.100 inch) Centers**
- **Ideal as Flush Mounted Panel Indicators**
- **Ideal for Backlighting Legends**
- **Long Life: Solid State Reliability**
- **Choice of 4 Bright Colors**
 - DH AS AlGaAs Red
 - High Efficiency Red
 - Yellow
 - High Performance Green
- **IC Compatible/Low Current Requirements**

The HLMP-R100 uses a double heterojunction (DH) absorbing substrate (AS) aluminum gallium arsenide (AlGaAs) red LED chip in a light red epoxy package. This combination produces outstanding light output over a wide range of drive currents.

The HLMP-0300 and -0301 have a high efficiency red GaAsP on GaP LED chip in a light red epoxy package.

The HLMP-0400 and -0401 provide a yellow GaAsP on GaP LED chip in a yellow epoxy package.

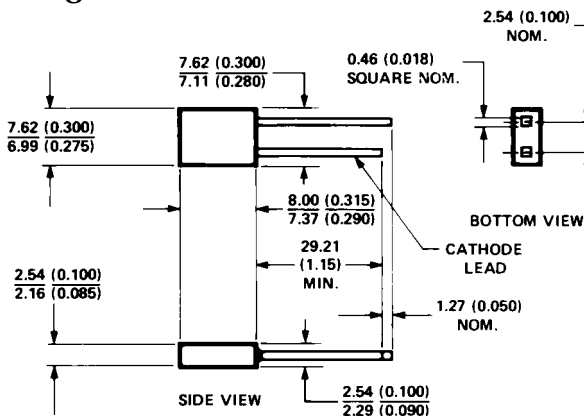


The HLMP-0503 and -0504 provide a green GaP LED chip in a green epoxy package.

Description

The HLMP-R100, -030X, -040X, -050X are solid state lamps encapsulated in a radial lead rectangular epoxy package. They utilize a tinted, diffused epoxy to provide high on-off contrast and a flat high intensity emitting surface. Borderless package design allows creation of uninterrupted light emitting areas.

Package Dimensions



- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES (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 TOP OF LAMP.

Axial Luminous Intensity

| Color | Part Number | I _v (mcd) @ 20 mA DC | |
|------------------------|-------------|---------------------------------|------|
| | | Min. | Typ. |
| DH AlGaAs Red | HLMP-R100 | 3.4 | 11.0 |
| High Efficiency Red | HLMP-0300 | 1.3 | 2.5 |
| | HLMP-0301 | 2.1 | 5.3 |
| Yellow | HLMP-0400 | 1.4 | 2.5 |
| | HLMP-0401 | 3.6 | 5.0 |
| High Performance Green | HLMP-0503 | 1.6 | 2.5 |
| | HLMP-0504 | 2.6 | 8.0 |

Absolute Maximum Ratings at T_A = 25°C

| Parameter | HLMP-R100 | HLMP-0300/-0301 | HLMP-0400/0401 | HLMP-0503/-0504 | Units |
|---|---------------------|-----------------|----------------|-----------------|-------|
| Peak Forward Current | 300 | 90 | 60 | 90 | mA |
| Average Forward Current ^[1] | 20 | 25 | 20 | 25 | mA |
| DC Current ^[2] | 30 | 30 | 20 | 30 | mA |
| Power Dissipation | 87 | 135 | 85 | 135 | mW |
| Reverse Voltage (I _R = 100 μA) | 5 | 5 | 5 | 5 | V |
| Transient Forward Current ^[3] (10 μs Pulse) | 500 | 500 | 500 | 500 | mA |
| Operating Temperature Range | -20 to +100 | -55 to +100 | -55 to +100 | -20 to +100 | °C |
| Storage Temperature Range | -55 to +100 | | | -55 to +100 | |
| Lead Soldering Temperature (1.6 mm [0.063 in.] from body) | 260°C for 5 seconds | | | | |

Notes:

- See Figure 5 to establish pulsed operating conditions.
- For AlGaAs Red, Red, and Green Series derate linearly from 50°C at 0.5 mA/°C. For Yellow Series derate linearly from 50°C at 0.2 mA/°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 the device be operated at peak current beyond the peak forward current listed in the Absolute Maximum Ratings.

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

| Sym. | Description | HLMP-R100 | | | HLMP-0300/0301 | | | HLMP-0400/0401 | | | HLMP-0503/0504 | | | Units | Test Conditions |
|-----------------------|---|-----------|------|------|----------------|------|------|----------------|------|------|----------------|------|------|--------------------|------------------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| $2\theta_{1/2}$ | Included Angle Between Half Luminous Intensity Points | | 100 | | | 100 | | | 100 | | | 100 | | Deg. | Note 1. Fig. 6 |
| λ_p | Peak Wavelength | | 645 | | | 635 | | | 583 | | | 565 | | nm | Measurement at Peak |
| λ_d | Dominant Wavelength | | 637 | | | 626 | | | 585 | | | 569 | | nm | Note 2 |
| $\Delta\lambda_{1/2}$ | Spectral Line Halfwidth | | 20 | | | 40 | | | 36 | | | 28 | | nm | |
| τ_s | Speed of Response | | 30 | | | 90 | | | 90 | | | 500 | | ns | |
| C | Capacitance | | 30 | | | 16 | | | 18 | | | 18 | | pF | $V_F = 0$; $f = 1 \text{ MHz}$ |
| $R\theta_{J-PIN}$ | Thermal Resistance | | 260 | | | 260 | | | 260 | | | 260 | | $^\circ\text{C/W}$ | Junction to Cathode Lead |
| V_F | Forward Voltage | | 1.8 | 2.2 | | 1.9 | 2.6 | | 2.1 | 2.6 | | 2.2 | 3.0 | V | $I_F = 20 \text{ mA}$ Figure 2. |
| V_R | Reverse Breakdown Voltage | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | | | V | $I_R = 100 \mu\text{A}$ |
| η_v | Luminous Efficacy | | 80 | | | 145 | | | 500 | | | 595 | | lm/W | Note 3 |

Notes:

- $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half 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.
- Radiant intensity, I_e , in watts/steradian, may be found from the equation $I_e = I_v/\eta_v$, where I_v is the luminous intensity in candelas and η_v is the luminous efficacy in lumens/watt.

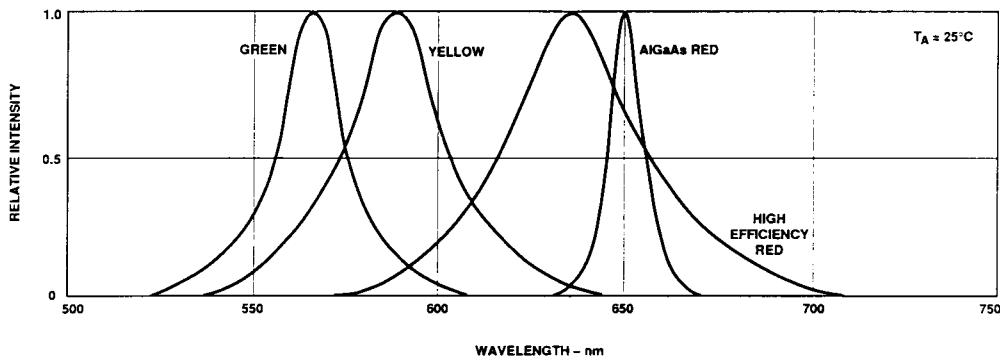


Figure 1. Relative Intensity vs. Wavelength.

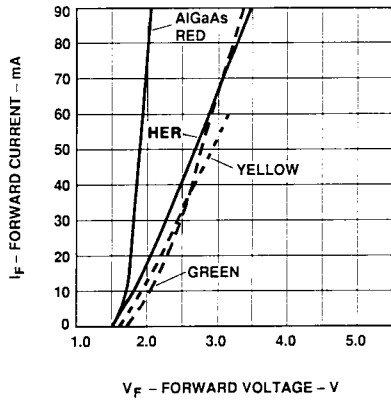


Figure 2. Forward Current vs. Forward Voltage. V_F (300 mA) for AlGaAs Red = 2.6 Volts Typical.

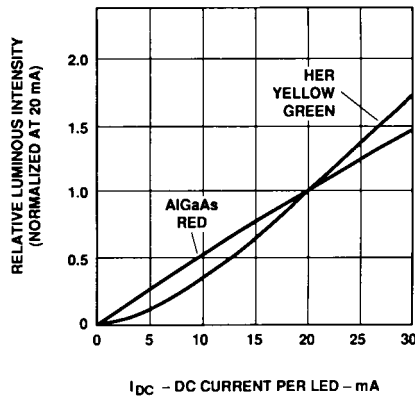


Figure 3. Relative Luminous Intensity vs. Forward Current.

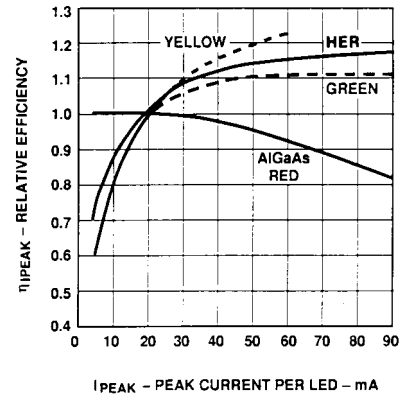


Figure 4. Relative Efficiency (Luminous Intensity per Unit Current) vs. Peak Current. η_v (300 mA) for AlGaAs Red = 0.7.

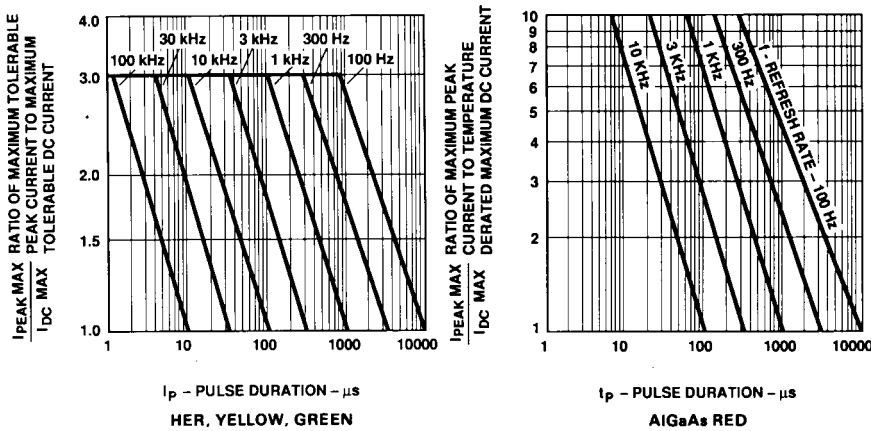


Figure 5. Maximum Tolerable Peak Current vs. Peak Duration ($I_{PEAK MAX}$ Determined from Temperature Derated $I_{DC MAX}$).

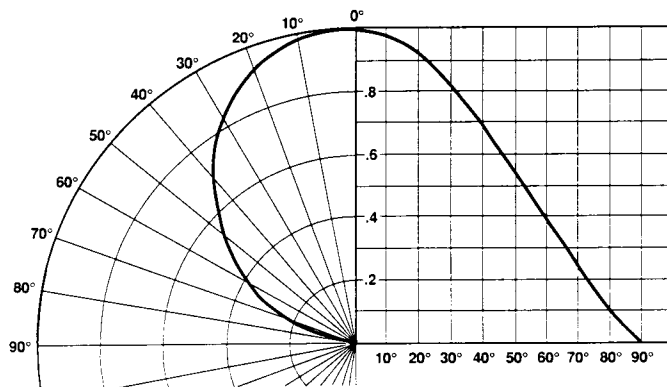


Figure 6. Relative Luminous Intensity vs. Angular Displacement.