322-910

HEWLETT PACKARD

High Power T-1 3/4 (5 mm) TS AlGaAs Red Lamps

Technical Data

HLMP-8104 4 Candela
HLMP-8103 3 Candela
HLMP-8102 2 Candela
HLMP-8100 Wide Angle

Features

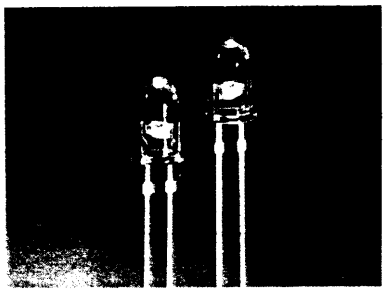
- Exceptional Brightness
- Outstanding LED Material Efficiency
- High Light Output Over a Wide Range of Drive Currents
- Viewing Angle: Narrow or Wide
- Low Forward Voltage
- Low Power Dissipation
- CMOS/MOS Compatible
- Red Color

Applications

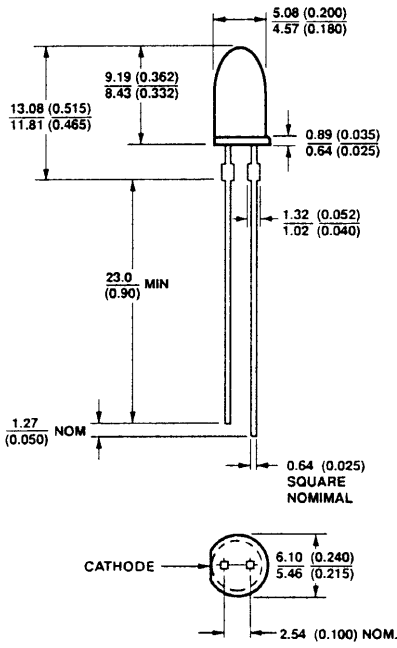
- Signaling Applications
- Emitter for Emitter/ Detector Applications
- Moving Message Signs
- Bright Ambient Lighting Conditions
- Automotive Lighting
- Medical Instruments
- Bar Code Readers
- Low Power Laser Replacement
- Alternative to Incandescent Lighting

Description

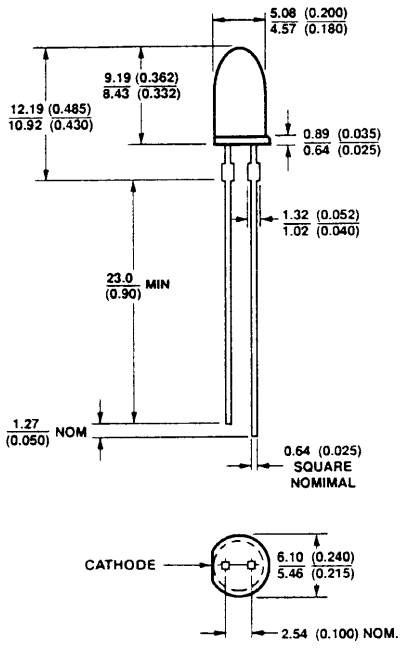
These untinted, nondiffused solid state lamps utilize a highly optimized LED material, transparent substrate aluminum gallium arsenide, TS AlGaAs. This material has outstanding light output efficiency over a wide range of currents, and has superior high current capability compared to most other LED materials. The lamp design utilizes advanced optical methods to enable extremely high peak intensity and a very narrow viewing angle. The LED color is red at a dominant wavelength of 637 nm.



Package Dimensions



HLMP-8104/8103/8102



HLMP-8100

Notes: 1. All Dimensions are in millimetres (inches).
2. The leads are mild steel. solder dipped.
3. An epoxy meniscus may extend about 1 mm (0.040 ") down the leads.

Axial Luminous Intensity and Viewing Angle at T_A= 25 °C

Part Number HLMP-	Minimum Intensity (cd) @ 20 mA	Typical Intensity (cd) @ 20 mA	Maximum Intensity (cd) @ 20 mA	Typical Radiant Intensity (mW/sr) @ 20 mA	$2\theta_{1/2}$ [1] Degrees
8104	2.9	4.0	8.4	47.1	7
8103	2.0	3.0	5.8	35.3	7
8102	1.4	2.0	4.0	23.5	7
8100	0.29	0.7	2.0	11.8	24

Note:
1. $\theta_{1/2}$ is the off axis angle from optical centerline where the luminous intensity is 1/2 the on-axis value.

Absolute Maximum Ratings at T_A = 25 °C

Peak Forward Current [1,2] ..... 300 mA
Average Forward Current (@ I_{PEAK}=300 mA) [2] ..... 15 mA
DC Forward Current [3] ..... 50 mA
Power Dissipation ..... 130 mW
Reverse Voltage (I_R=100 μA) ..... 8 V
Transient Forward Current (10 μs Pulse) [4] ..... 500 mA
Operating Temperature Range ..... -55 to +100°C
Storage Temperature Range ..... -55 to +100°C
Lead Soldering Temperature
[1.6 mm (0.063 in.) from body] ..... 260°C for 5 seconds

Notes:
1. Maximum I_{PEAK} at f = 1 kHz, DF = 5%.
2. Refer to Figure 6 to establish pulsed operating conditions.
3. Derate linearly as shown in Figure 5.
4. The transient peak current is the maximum non-recurring peak current the device can withstand without damaging the LED die and wire bonds. It is not recommended that the device be operated at peak currents above the Absolute Maximum Peak Forward Current.

Electrical/Optical Characteristics at T_A = 25 °C

Description	Symbol	Min	Typ	Max	Units	Test Condition
Forward Voltage	V_F		1.85	2.4	V	I_F = 20 mA
Reverse Voltage	V_R	8.0	20.0		V	I_R = 100 μA
Peak Wavelength	λ_{PEAK}		650		nm	
Dominant Wavelength [1]	λ_d		637		nm	
Spectral Line Halfwidth	$\Delta\lambda 1/2$		22		nm	
Speed of Response	τ_s		45		ns	Exponential Time Constant, e^{-t/τ_s}
Capacitance	C		20		pF	V_F = 0, f = 1 MHz
Thermal Resistance	$R\theta_{J\text{-}PIN}$		220		°C/W	Junction-to-Cathode Lead
Luminous Efficacy [2]	η_v		85		lm/W	

Notes:
1. The dominant wavelength, λ_d, is derived from the CIE chromaticity diagram and represents the color of the device.
2. The radiant intensity, I_e, in watts per 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 luminous efficacy in lumens/watt.
3. The approximate total luminous flux output within a cone angle of 2θ about the optical axis may be obtained from the following formula:
$\phi_v 2(\theta) = [\phi_v(\theta)/I_v(0)]I_v$;
Where: $\phi_v(\theta)/I_v(0)$ is obtained from Figure 7.

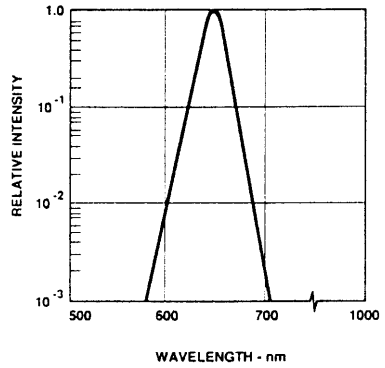


Figure 1. Relative Intensity vs Wavelength.

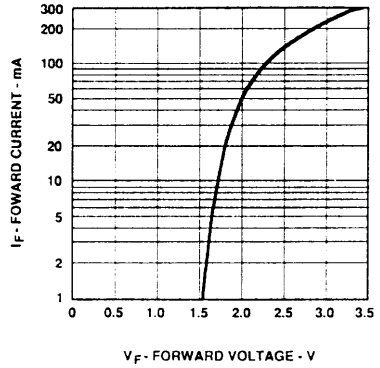


Figure 2. Forward Current vs Forward Voltage.

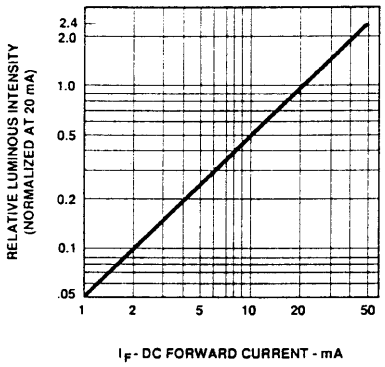


Figure 3. Relative Luminous Intensity vs DC Forward Current.

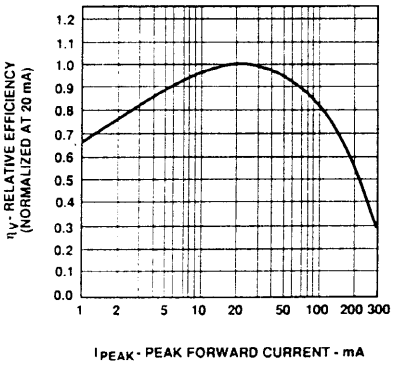


Figure 4. Relative Efficiency vs Peak Forward Current.

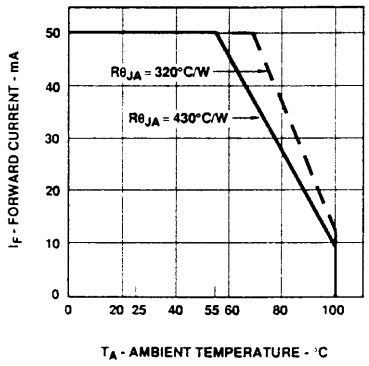


Figure 5. Maximum Forward DC Current vs Ambient Temperature.
Derating Based on T_JMAX = 110°C.

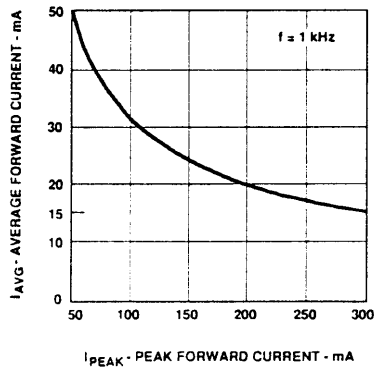


Figure 6. Maximum Average Current vs Peak Forward Current. Refresh Rate = 1 kHz.

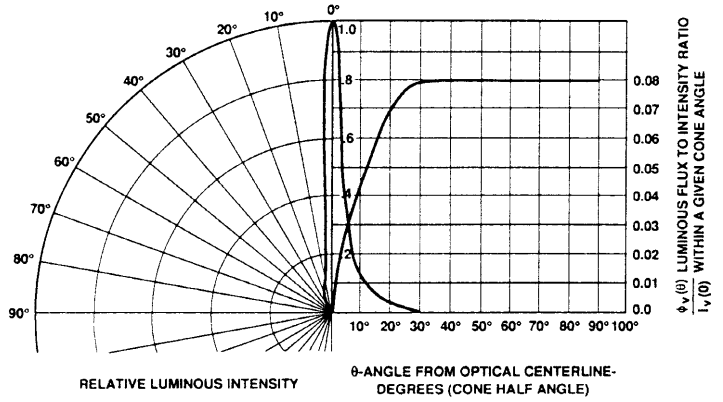


Figure 7. Relative Luminous Intensity vs Angular Displacement. HLMP-8104, HLMP-8103 and HLMP-8102.

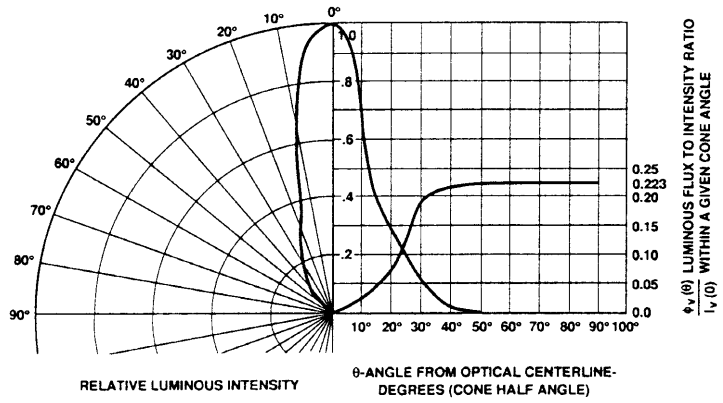


Figure 8. Relative Luminous Intensity vs Angular Displacement. HLMP-8100.

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