

HLMP-WL02, HLMP-WG02

High Intensity AlInGaP LED Lamps

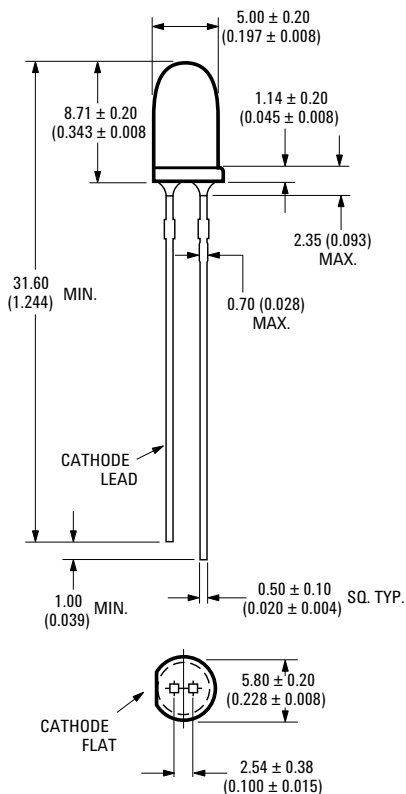


Data Sheet

Description

This 5 mm LED lamp is specially designed for applications requiring higher levels of intensity than is achieved with a standard lamp. The 5 mm lamp is available with 65 degree viewing angle.

Package Dimensions



Features

- T-1 3/4 (5 mm) General Purpose LED Lamps
- AllInGaP SunPower Intensity
- High Light Output
- Tinted Diffused Lens
- Amber and Red
- Available on Tape and Reel

Applications

- General Purpose
- Consumer Goods
- Indicator Lights

Device Selection Guide

T-1 3/4 (5 mm) Lamp		Luminous Intensity	Viewing Angle
Color	Part Number	Min. mcd, I _f @ 20 mA	2θ _{1/2} (Degrees)
Amber	HLMP-WL02	35	65
Red	HLMP-WG02	26	65

Notes:

1. Dominant Wavelength, λ_d, is derived from the CIE Chromaticity Diagram, and represents the color of the lamp.
2. θ_{1/2} is the off-axis angle where the luminous intensity is one half the on-axis intensity.
3. The luminous intensity is measured on the mechanical axis of the lamp package.
4. The optical axis is closely aligned with the package mechanical axis.

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

Parameter	5 mm
DC Forward Current	50 mA ^[1,3,4]
Peak Pulsed Forward Current ^[3,4]	70 mA
Average Forward Current	30 mA
Reverse Voltage ($I_R = 100$ mA)	5 V
LED Junction Temperature	130°C
Operating Temperature	-40°C to + 100°C
Storage Temperature	-40°C to + 120°C

Notes:

1. Derate linearly as shown in Figure 4.
2. For long term performance with minimal light output degradation, drive currents between 10 and 30 mA are recommended.
3. Please contact your Avago Technologies sales representative about operating currents below 10 mA.

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

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage Amber ($\lambda_d = 590$ nm) Red ($\lambda_d = 626$ nm)	V_F		2.02 1.90	2.4	V	$I_F = 20$ mA
Reverse Voltage	V_R	5	20		V	$I_R = 100$ mA
Peak Wavelength Amber Red	λ_{PEAK}		592 635		nm	Peak of Wavelength of Spectral Distribution at $I_F = 20$ mA
Spectral Halfwidth	$\Delta\lambda_{1/2}$		17		nm	Wavelength Width at Spectral Distribution $1/2$ Power point at $I_F = 20$ mA
Speed of Response	τ_s		20		ns	Exponential Time Constant, e^{-t/τ_s}
Capacitance	C		40		pF	$V_F = 0$, $f = 1$ MHz
Thermal Resistance	$R\theta_{J-PIN}$		240		°C/W	LED Junction-to-Cathode Lead
Luminous Efficacy ^[5] Amber Red	η_v		500 155		lm/W	Emitted Luminous Power/Emitted Radiant Power

Note:

1. 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 the luminous efficacy in lumens/watt.

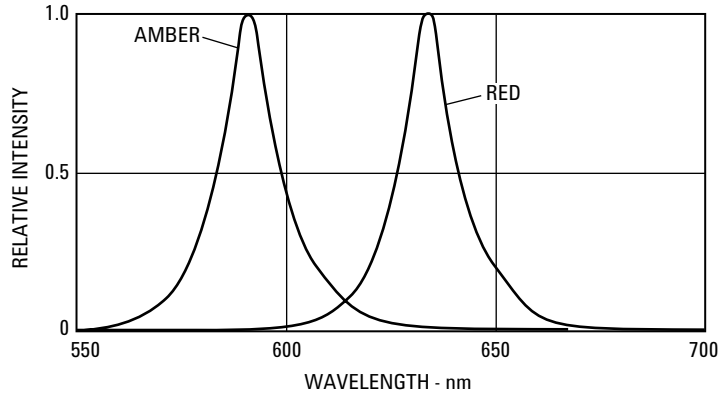


Figure 1. Relative Intensity vs. Peak Wavelength.

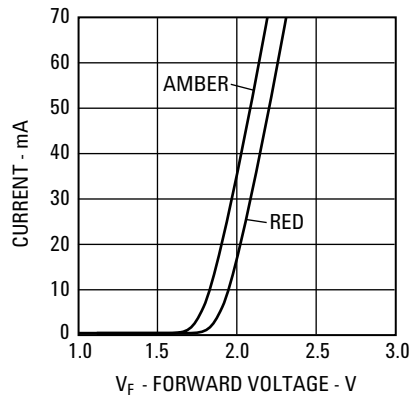


Figure 2. Forward Current vs. Forward Voltage.

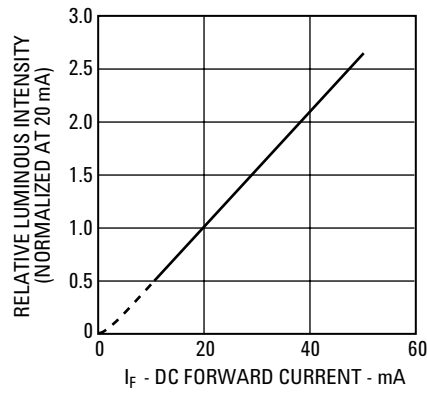


Figure 3. Relative Luminous Intensity vs. Forward Current.

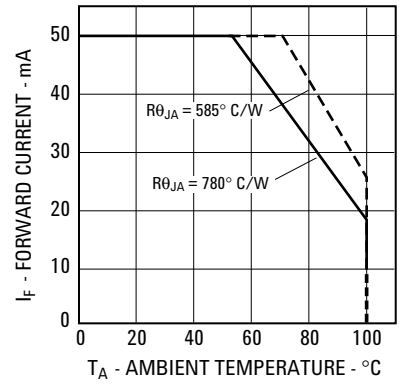


Figure 4. Maximum Forward Current vs. Ambient Temperature. Derating Based on $T_{JMAX} = 130^{\circ}C$.

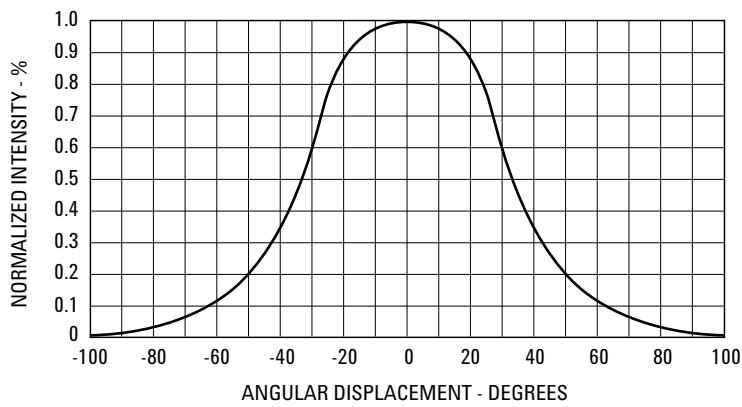


Figure 5. Representative Spatial Radiation Pattern for 65°

Precautions:

Lead Forming:

- The leads of an LED lamp may be preformed or cut to length prior to insertion and soldering into PC board.
- If lead forming is required before soldering, care must be taken to avoid any excessive mechanical stress induced to LED package. Otherwise, cut the leads of LED to length after soldering process at room temperature. The solder joint formed will absorb the mechanical stress of the lead cutting from traveling to the LED chip die attach and wirebond.
- It is recommended that tooling made to precisely form and cut the leads to length rather than rely upon hand operation.

Soldering Condition:

- Care must be taken during PCB assembly and soldering process to prevent damage to LED component.
- The closest LED is allowed to solder on board is 1.59mm below the body (encapsulant epoxy) for those parts without standoff.
- Recommended soldering condition:

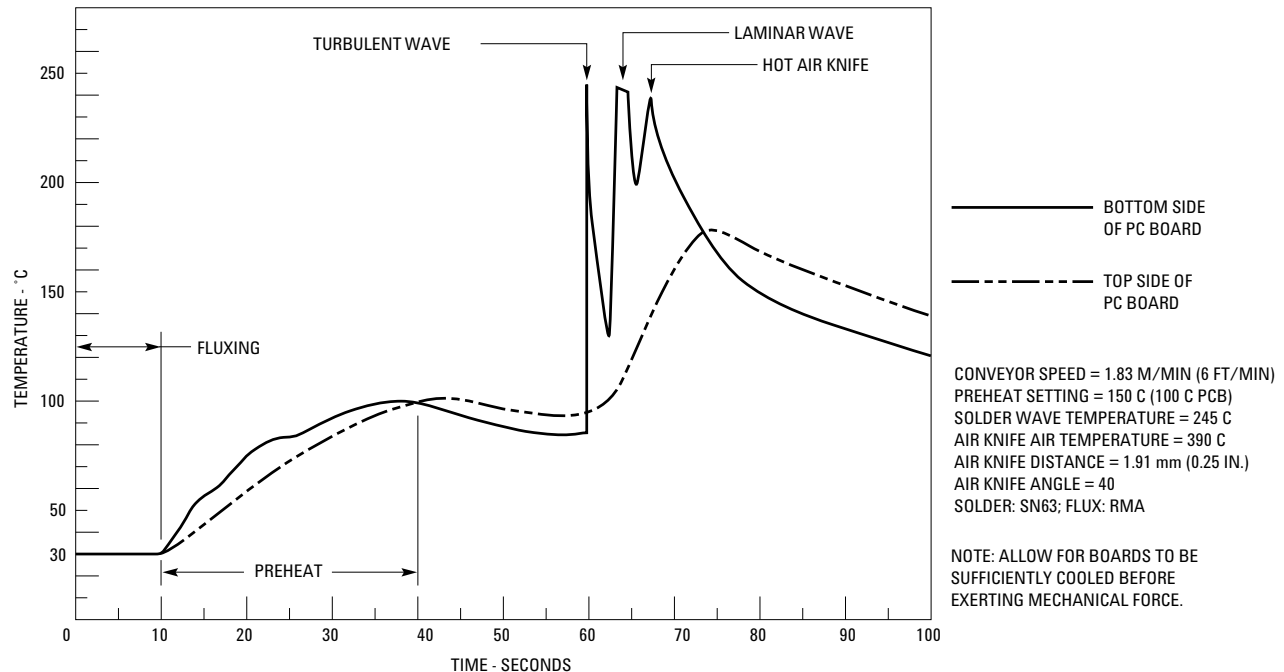
	Wave Soldering	Manual Solder Dipping
Pre-heat temperature	105 °C Max.	–
Preheat time	30 sec Max	–
Peak temperature	250 °C Max.	260 °C Max.
Dwell time	3 sec Max.	5 sec Max

- Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave. Customer is advised to periodically check on the soldering profile to ensure the soldering profile used is always conforming to recommended soldering condition.
- If necessary, use fixture to hold the LED component in proper orientation with respect to the PCB during soldering process.
- Proper handling is imperative to avoid excessive thermal stresses to LED components when heated. Therefore, the soldered PCB must be allowed to cool to room temperature, 25°C before handling.
- Special attention must be given to board fabrication, solder masking, surface plating and lead holes size and component orientation to assure solderability.
- Recommended PC board plated through holes size for LED component leads.

LED component lead size	Diagonal	Plated through hole diameter
0.457 x 0.457mm (0.018 x 0.018inch)	0.646 mm (0.025 inch)	0.976 to 1.078 mm (0.038 to 0.042 inch)
0.508 x 0.508mm (0.020 x 0.020inch)	0.718 mm (0.028 inch)	1.049 to 1.150mm (0.041 to 0.045 inch)

Note: Refer to application note AN1027 for more information on soldering LED components.

Recommended Wave Soldering Profile



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