HLMP-DL50

T-1$^3/_4$ (5 mm) Precision Optical Performance AlInGaP LED Lamps for Variable Message Signs

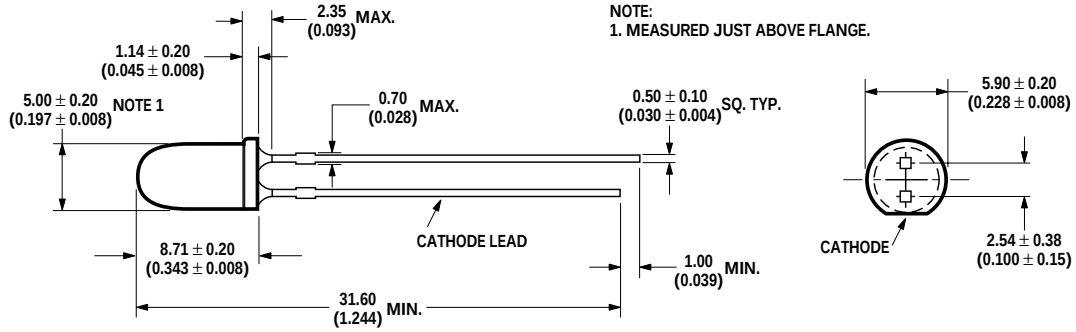
Data Sheet

Device Selection Guide

Part Number HLMP-	Typical Viewing Angle $2\theta_{1/2}$ (Deg.)	Dominant Wavelength Range	Luminous Intensity (mcd at I_F = 20 mA)[1]
DL50	15	586.5 to 590.5 nm	4200 to 7200
DL51	15	588.5 to 592.5 nm	4200 to 7200

Note:
1. The luminous intensity is measured on the mechanical axis of the lamp package.

Package Dimensions[2]



Note:
2. This part is only offered in a flanged package without stand-offs.

Absolute Maximum Ratings at T_A = 25°C

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

Notes:
3. For long term performance with minimal light output degradation, drive currents between 10 and 30 mA are recommended.
4. Please contact your sales representative about operating currents below 10 mA.

Electrical / Optical Characteristics at T_A = 25°C

Parameter	Symbol	Min.	Typical	Max.	Units	Test Conditions
Forward Voltage	V_F		2.02	2.4	V	I_F = 20 mA
Reverse Voltage	V_R	5	20		V	I_R = 100 µA
Peak Wavelength	λ_{PEAK}		592		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	t_s		20		ns	Exponential Time Constant, e^{-t/t_s}
Capacitance	C		40		pF	V_F = 0, f = 1 MHz
Thermal Resistance	$R\theta_{J\text{-}PIN}$		240		°C/W	LED Junction-to-Cathode Lead
Luminous Efficacy[5]	η_V		480		lm/W	Emitted Luminous Power / Emitted Radiant Power

Note:

5. The radiant intensity, I_e, in watts per steridian, 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.

Intensity Bin Limits (mcd at 20 mA)

Bin Name	Min.	Max.
V	4200	5500
W	5500	7200

Note:

6. Tolerance for each bin limit is ± 15%.

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 Conditions

- 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 1.59 mm below the body (encapsulant epoxy) for those parts without standoff.
- Recommended soldering conditions:

	Wave Soldering	Manual Solder Dipping
Pre-heat Temperature	105 °C Max.	–
Pre-heat 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 maintained 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 hole sizes for LED component leads:

LED Component Lead Size	Diagonal	Plated Through Hole Diameter
0.457 x 0.457 mm (0.018 x 0.018 inch)	0.646 mm (0.025 inch)	0.976 to 1.078 mm (0.038 to 0.042 inch)
0.508 x 0.508 mm (0.020 x 0.020 inch)	0.718 mm (0.028 inch)	1.049 to 1.150 mm (0.041 to 0.045 inch)

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

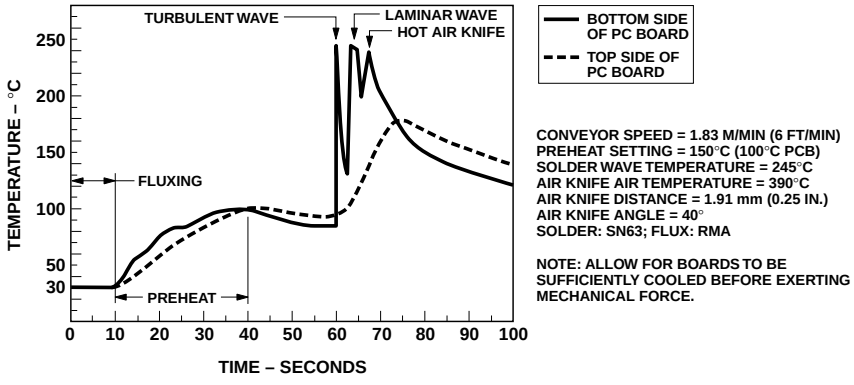


Figure 1. Recommended wave soldering profile.

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