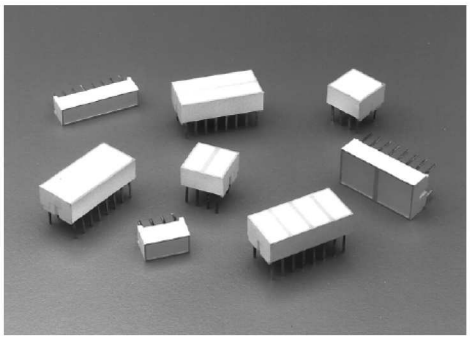
# LED Light Bars

HLCP-A100/-B100/-C100/D100/-E100/-F100/-G100/-H100
HLMP-2300/-2350/-2400/-2450/-2500/-2550
HLMP-2600/-2620/-2635/-2655/-2670/-2685
HLMP-2700/-2720/-2735/-2755/-2770/-2785
HLMP-2800/-2820/-2835/-2855/-2870/-2885
HLMP-2950/-2965

## Data Sheet



### Description

The HLCP-X100 and HLMP-2XXX series light bars are rectangular light sources designed for a variety of applications where a large bright source of light is required. These light bars are configured in single-in-line and dual-in-line packages that contain either single or segmented light emitting areas. The AlGaAs Red HLCP-X100 series LEDs use double heterojunction AlGaAs on a GaAs substrate. The HER HLMP-2300/2600 and Yellow HLMP-2400/2700 series LEDs have their p-n junctions diffused into a GaAsP epitaxial layer on a GaP substrate. The Green HLMP-2500/2800 series LEDs use a liquid phase GaP epitaxial layer on a GaP substrate. The bicolor HLMP-2900 series use a combination of HER/Yellow or HER/Green LEDs.

### Features

- Large bright, uniform light emitting areas
- Choice of colors
- Categorized for light output
- Yellow and Green categorized for dominant wavelength
- Excellent ON-OFF contrast
- X-Y stackable
- Flush mountable
- Can be used with panel and legend mounts
- Light emitting surface suitable for legend attachment per Application Note 1012
- HLCP-X100 Series designed for low current operation
- Bicolor devices available

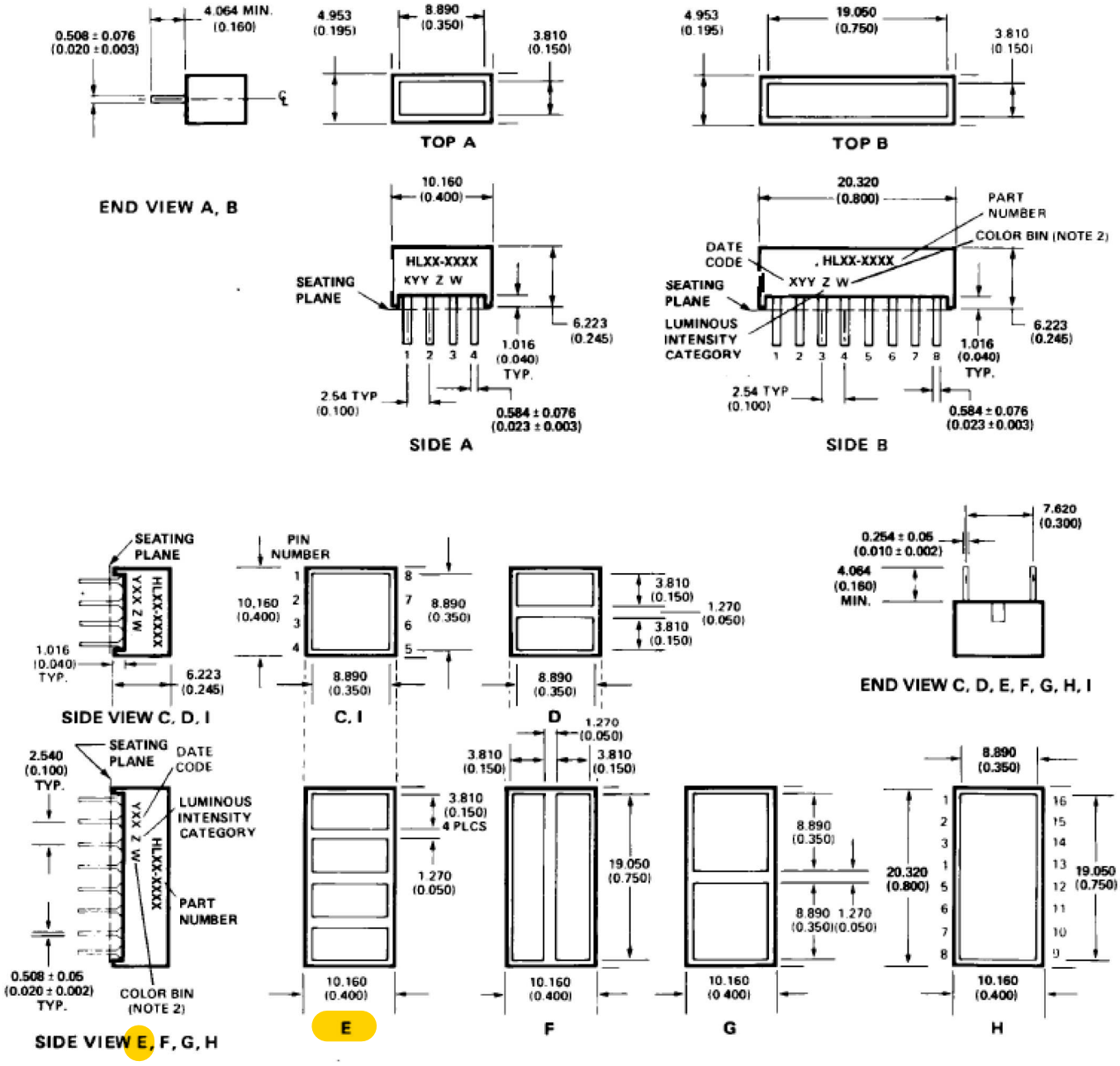
### Applications

- Business machine message annunciators
- Telecommunications indicators
- Front panel process status indicators
- PC board identifiers
- Bar graphs

## Selection Guide

| Light Bar Part Number | | | | Size of Light Emitting Areas | Number of Light Emitting Areas | Package Outline |
|---|---|---|---|---|---|---|
| HLCP- | | HLMP- | | | | |
| AlGaAs | HER | Yellow | Green | | | |
| A100 | 2300 | 2400 | 2500 | 8.89 mm x 3.81 mm (.350 in. x .150 in.) | 1 | A |
| B100 | 2350 | 2450 | 2550 | 19.05 mm x 3.81 mm (.750 in. x .150 in.) | 1 | B |
| D100 | 2600 | 2700 | 2800 | 8.89 mm x 3.81 mm (.350 in. x .150 in.) | 2 | D |
| E100 | 2620 | 2720 | 2820 | 8.89 mm x 3.81 mm (.350 in. x .150 in.) | 4 | E |
| F100 | 2635 | 2735 | 2835 | 3.81 mm x 19.05 mm (.150 in. x .750 in.) | 2 | F |
| C100 | 2655 | 2755 | 2855 | 8.89 mm x 8.89 mm (.350 in. x .350 in.) | 1 | C |
| G100 | 2670 | 2770 | 2870 | 8.89 mm x 8.89 mm (.350 in. x .350 in.) | 2 | G |
| H100 | 2685 | 2785 | 2885 | 8.89 mm x 19.05 mm (.350 in. x .750 in.) | 1 | H |
| | 2950 | 2950 | | 8.89 mm x 8.89 mm (.350 in. x .350 in.) | Bicolor | I |
| | 2965 | | 2965 | 8.89 mm x 8.89 mm (.350 in. x .350 in.) | Bicolor | I |

## Package Dimensions

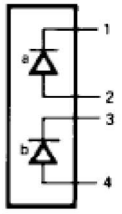



**NOTES:**

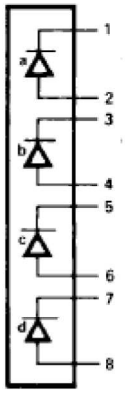
**1. DIMENSIONS IN MILLIMETRES (INCHES). TOLERANCES ±0.25 mm (±0.010 IN.) UNLESS OTHERWISE INDICATED.**

**2. FOR YELLOW AND GREEN DEVICES ONLY.**

## Internal Circuit Diagrams

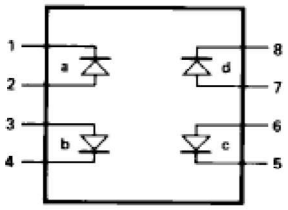



A

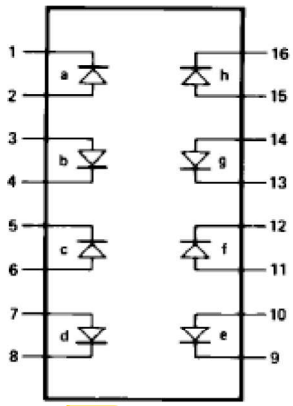



B

| PIN FUNCTION | | |
|---|---|---|
| PIN | A<br>-2300/-2400<br>-2500/A100 | B<br>-2350/-2450<br>-2550/B100 |
| 1 | CATHODE a | CATHODE a |
| 2 | ANODE a | ANODE a |
| 3 | CATHODE b | CATHODE b |
| 4 | ANODE b | ANODE b |
| 5 | | CATHODE c |
| 6 | | ANODE c |
| 7 | | CATHODE d |
| 8 | | ANODE d |

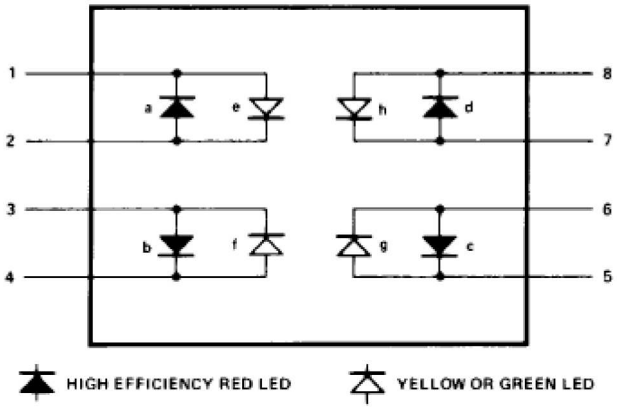



C,D




E,F,G,H

| PIN | PIN FUNCTION | |
|---|---|---|
| | C, D | E, F, G, H |
| 1 | CATHODE a | CATHODE a |
| 2 | ANODE a | ANODE a |
| 3 | ANODE b | ANODE b |
| 4 | CATHODE b | CATHODE b |
| 5 | CATHODE c | CATHODE c |
| 6 | ANODE c | ANODE c |
| 7 | ANODE d | ANODE d |
| 8 | CATHODE d | CATHODE d |
| 9 | | CATHODE e |
| 10 | | ANODE e |
| 11 | | ANODE f |
| 12 | | CATHODE f |
| 13 | | CATHODE g |
| 14 | | ANODE g |
| 15 | | ANODE h |
| 16 | | CATHODE h |




| PIN | PIN FUNCTION | |
|---|---|---|
| | HER | YELLOW/<br>GREEN |
| 1 | CATHODE a | ANODE e |
| 2 | ANODE a | CATHODE e |
| 3 | ANODE b | CATHODE f |
| 4 | CATHODE b | ANODE f |
| 5 | CATHODE c | ANODE g |
| 6 | ANODE c | CATHODE g |
| 7 | ANODE d | CATHODE h |
| 8 | CATHODE d | ANODE h |

## Absolute Maximum Ratings

| Parameter | AlGaAs Red HLCP-X100 Series | HER HLMP-2300/ 2600/29XX Series | Yellow HLMP-2400/ 2700/2950 Series | Green HLMP-2500/ 2800/2965 Series |
|---|---|---|---|---|
| Average Power Dissipated per LED Chip | 37 mW[1] | 135 mW[2] | 85 mW[3] | 135 mW[2] |
| Peak Forward Current per LED Chip | 45 mA[4] | 90 mA[5] | 60 mA[5] | 90 mA[5] |
| Average Forward Current per LED Chip | 15 mA | 25 mA | 20 mA | 25 mA |
| DC Forward Current per LED Chip | 15 mA[1] | 30 mA[2] | 25 mA[3] | 30 mA[2] |
| Reverse Voltage* per LED Chip | 5 V | | 6 V[6] | |
| Operating Temperature Range | –20°C to +100°C[7] | –40°C to +85°C | | –20°C to +85°C |
| Storage Temperature Range | –40°C to +85°C | | | |
| Wave Soldering Temperature 1.6 mm (1/16 inch) below Body | 250°C for 3 seconds | | | |

* Reverse Voltage is for LED testing purpose and not recommended to be used as application condition.

Notes:
1. Derate above 87°C at 1.7 mW/°C per LED chip. For DC operation, derate above 91°C at 0.8 mA/°C.
2. Derate above 25°C at 1.8 mW/°C per LED chip. For DC operation, derate above 50°C at 0.5 mA/°C.
3. Derate above 50°C at 1.8 mW/°C per LED chip. For DC operation, derate above 60°C at 0.5 mA/°C.
4. See Figure 1 to establish pulsed operation. Maximum pulse width is 1.5 mS.
5. See Figure 6 to establish pulsed operation. Maximum pulse width is 2 mS.
6. Does not apply to bicolor parts.
7. For operation below –20°C, contact your local Avago sales representative.

## Electrical/Optical Characteristics at $T_A = 25°C$

### AlGaAs Red HLCP-X100 Series

| Parameter | HLCP- | Symbol | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|---|
| Luminous Intensity per Lighting Emitting Area[1] | A100/D100/E100 | $I_V$ | 3 | 7.5 | | mcd | $I_F = 3$ mA |
| | B100/C100/F100/G100 | | 6 | 15 | | mcd | |
| | H100 | | 12 | 30 | | mcd | |
| Peak Wavelength | | $\lambda_{PEAK}$ | | 645 | | nm | |
| Dominant Wavelength[2] | | $\lambda_d$ | | 637 | | nm | |
| Forward Voltage per LED | | $V_F$ | | 1.8 | 2.2 | V | $I_F = 20$ mA |
| Reverse Breakdown Voltage per LED | | $V_R$ | 5 | 15 | | V | $I_R = 100$ µA |
| Thermal Resistance LED Junction-to-Pin | | $R\theta_{J\text{-}PIN}$ | | 250 | | °C/W/ LED | |

## High Efficiency Red HLMP-2300/2600/2900 Series

| Parameter | HLMP- | Symbol | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|---|
| Luminous Intensity per Lighting Emitting Area[1] | 2300/2600/2620 | $I_V$ | 6 | 23 | | mcd | $I_F$ = 20 mA |
| | 2350/2635/2655/2670/2950[3] | | 13 | 45 | | mcd | |
| | 2965[4] | | 19 | 45 | | mcd | |
| | 2685 | | 22 | 80 | | mcd | |
| Peak Wavelength | | $\lambda_{PEAK}$ | | 635 | | nm | |
| Dominant Wavelength[2] | | $\lambda_d$ | | 626 | | nm | |
| Forward Voltage per LED | | $V_F$ | | 2.0 | 2.6 | V | $I_F$ = 20 mA |
| Reverse Breakdown Voltage per LED[5] | | $V_R$ | 6 | 15 | | V | $I_R$ = 100 µA |
| Thermal Resistance LED Junction-to-Pin | | $R\theta_{J\text{-}PIN}$ | | 150 | | °C/W/ LED | |

## Yellow HLMP-2400/2700/2950 Series

| Parameter | HLMP- | Symbol | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|---|
| Luminous Intensity per Lighting Emitting Area[1] | 2400/2700/2720 | $I_V$ | 6 | 20 | | mcd | $I_F$ = 20 mA |
| | 2450/2735/2755/2770/2950[3] | | 13 | 38 | | mcd | |
| | 2785 | | 26 | 70 | | mcd | |
| Peak Wavelength | | $\lambda_{PEAK}$ | | 583 | | nm | |
| Dominant Wavelength[2] | | $\lambda_d$ | | 585 | | nm | |
| Forward Voltage per LED | | $V_F$ | | 2.1 | 2.6 | V | $I_F$ = 20 mA |
| Reverse Breakdown Voltage per LED[5] | | $V_R$ | 6 | 15 | | V | $I_R$ = 100 µA |
| Thermal Resistance LED Junction-to-Pin | | $R\theta_{J\text{-}PIN}$ | | 150 | | °C/W/ LED | |

## High Performance Green HLMP-2500/2800/2965 Series

| Parameter | HLMP- | Symbol | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|---|
| Luminous Intensity per Lighting Emitting Area[1] | 2500/2800/2820 | $I_V$ | 5 | 25 | | mcd | $I_F$ = 20 mA |
| | 2550/2835/2855/2870 | | 11 | 50 | | mcd | |
| | 2965[4] | | 25 | 50 | | mcd | |
| | 2885 | | 22 | 100 | | mcd | |
| Peak Wavelength | | $\lambda_{PEAK}$ | | 565 | | nm | |
| Dominant Wavelength[2] | | $\lambda_d$ | | 572 | | nm | |
| Forward Voltage per LED | | $V_F$ | | 2.2 | 2.6 | V | $I_F$ = 20 mA |
| Reverse Breakdown Voltage per LED[5] | | $V_R$ | 6 | 15 | | V | $I_R$ = 100 µA |
| Thermal Resistance LED Junction-to-Pin | | $R\theta_{J\text{-}PIN}$ | | 150 | | °C/W/ LED | |

**Notes:**

1. These devices are categorized for luminous intensity. The intensity category is designated by a letter code on the side of the package.
2. The dominant wavelength, $\lambda_d$, is derived from the CIE chromaticity diagram and is the single wavelength which defines the color of the device. Yellow and Green devices are categorized for dominant wavelength with the color bin designated by a number code on the side of the package.
3. This is an HER/Yellow bicolor light bar. HER electrical/optical characteristics are shown in the HER table. Yellow electrical/optical characteristics are shown in the Yellow table.
4. This is an HER/Green bicolor light bar. HER electrical/optical characteristics are shown in the HER table. Green electrical/optical characteristics are shown in the Green table.
5. Does not apply to HLMP-2950 or HLMP-2965.