

Agilent HLMP-LB11/HLMP-LM11

4 mm Precision Optical Performance

InGaN Standard Oval LED Lamps

Data Sheet



Description

These Precision Optical Performance Oval LEDs are specifically designed for full color/video and passenger information signs. The oval shaped radiation pattern and high luminous intensity ensure that this device is excellent for wide field of view outdoor applications where a wide viewing angle and readability in sunlight are essential. This lamp has very smooth, matched radiation patterns ensuring consistent color mixing in full color applications,

message uniformity across the viewing angle of the sign. High efficiency LED material is used in this lamp: Indium Gallium Nitride for Blue and Green. Each lamp is made with an advanced optical grade epoxy offering superior high temperature and high moisture resistance in outdoor applications. The package epoxy contains both UV-a and UV-b inhibitors to reduce the effects of long term exposure to direct sunlight.

Features

- Well defined spatial radiation pattern
- High brightness material
 - Blue InGaN 470 nm
 - Green InGaN 525 nm

Applications

- Full color signs
- Commercial outdoor advertising

Benefits

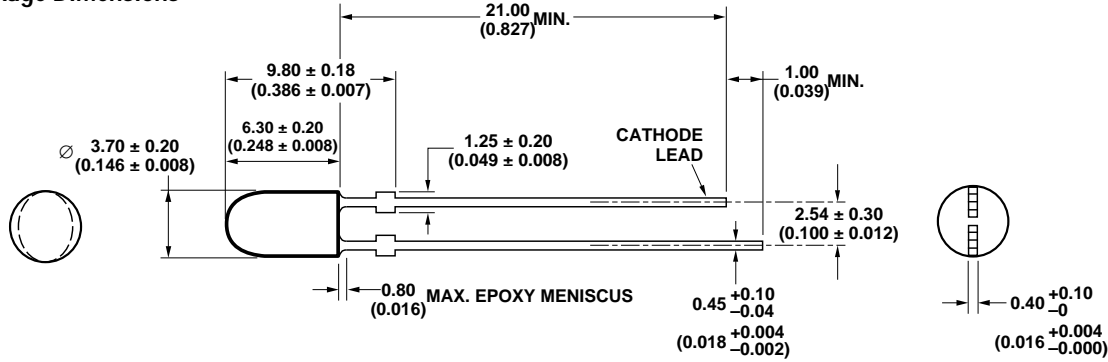
- Viewing angle designed for wide field of view applications
- Superior performance for outdoor environments

Caution: Devices are Class I ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Application Note AN-1142 for additional details.



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Package Dimensions



NOTES:

1. DIMENSIONS IN MILLIMETERS (INCHES).
2. TOLERANCE ± 0.1 mm UNLESS OTHERWISE NOTED.

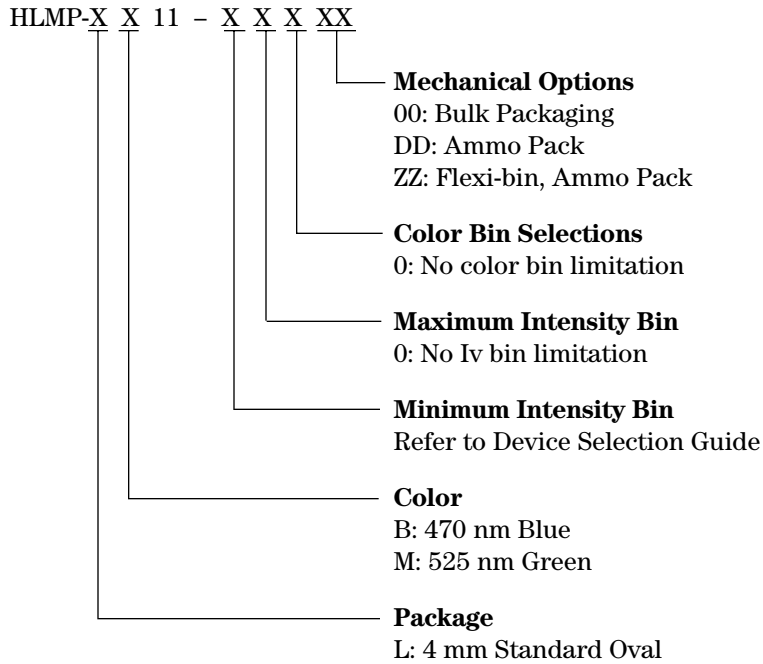
Device Selection Guide

Part Number	Color and Dominant Wavelength λ_d (nm) Typ.	Luminous Intensity I_v (mcd) at 20 mA Min.	Luminous Intensity I_v (mcd) at 20 mA Max.	Tinting Type
HLMP-LB11-FJ0xx	Blue 470	110	310	Blue
HLMP-LB11-HJCxx	Blue 470	180	310	Blue
HLMP-LB11-HL0xx	Blue 470	180	520	Blue
HLMP-LB11-JKCxx	Blue 470	240	400	Blue
HLMP-LB11-KN0xx	Blue 470	310	880	Blue
HLMP-LM11-LP0xx	Green 525	400	1150	Green
HLMP-LM11-MNCxx	Green 525	520	880	Green
HLMP-LM11-NR0xx	Green 525	680	1900	Green
HLMP-LM11-PQCxx	Green 525	880	1500	Green
HLMP-LM11-QRCxx	Green 525	1150	1900	Green
HLMP-LM11-QT0xx	Green 525	1150	3200	Green

Notes:

1. The luminous intensity is measured on the mechanical axis of the lamp package.
2. The optical axis is closely aligned with the package mechanical axis.
3. The dominant wavelength, λ_d , is derived from the Chromaticity Diagram and represents the color of the lamp.
4. Tolerance for intensity limit is ±15%.

Part Numbering System



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

Parameter	Value
DC Forward Current ^[1]	30 mA
Peak Pulsed Forward Current ^[2]	100 mA
Power Dissipation	130 mW
Reverse Voltage	5 V ($I_R = 10 \mu\text{A}$)
LED Junction Temperature	130°C
Operating Temperature Range	-40°C to +80°C
Storage Temperature Range	-40°C to +100°C
Wave Soldering Temperature ^[3]	250°C for 3 secs
Solder Dipping Temperature ^[3]	260°C for 5 secs

Notes:

1. Derate linearly as shown in Figure 3.
2. Duty Factor 10%, Frequency 1 kHz.
3. 1.59 mm (0.060 inch) below body.

Electrical /Optical Characteristics Table

$T_A = 25^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage						
Blue ($\lambda_d = 470 \text{ nm}$)	V_F		3.8	4.0	V	$I_F = 20 \text{ mA}$
Green ($\lambda_d = 525 \text{ nm}$)			3.8	4.0		
Reverse Voltage	V_R	5			V	$I_R = 10 \mu\text{A}$
Capacitance						
Blue ($\lambda_d = 470 \text{ nm}$)	C		43		pF	$V_F = 0, f = 1 \text{ MHz}$
Green ($\lambda_d = 525 \text{ nm}$)			43			
Thermal Resistance	$R\theta_{J-PIN}$		240		$^\circ\text{C/W}$	LED Junction-to-Cathode Lead
Peak Wavelength						
Blue ($\lambda_d = 470 \text{ nm}$)	λ_P		467		nm	Peak of Wavelength of Spectral Distribution at $I_F = 20 \text{ mA}$
Green ($\lambda_d = 525 \text{ nm}$)			520			
Spectral Halfwidth						
Blue ($\lambda_d = 470 \text{ nm}$)	$\Delta\lambda_{1/2}$		24		nm	Wavelength Width at Spectral Distribution Power Point at $I_F = 20 \text{ mA}$
Green ($\lambda_d = 525 \text{ nm}$)			35			
Luminous Efficacy						
Blue ($\lambda_d = 470 \text{ nm}$)	η_v		75		lm/W	Emitted luminous power/Emitted radiant power
Green ($\lambda_d = 525 \text{ nm}$)			520			

Notes:

1. $2\theta_{1/2}$ is the off-axis angle where the luminous intensity is $1/2$ the on axis intensity.
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 the luminous efficacy in lumens/watt.

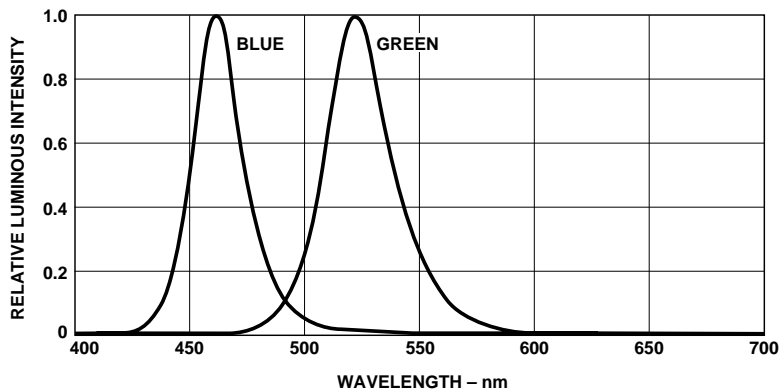


Figure 1. Relative intensity vs. wavelength.

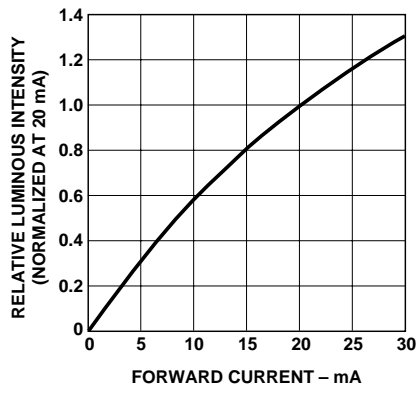


Figure 2. Relative luminous intensity vs. forward current.

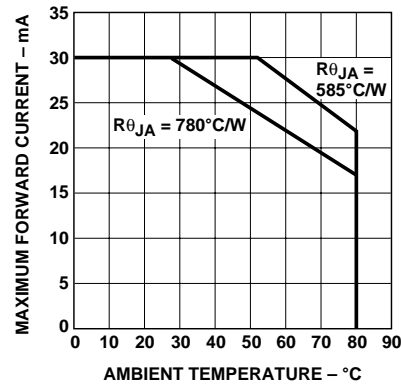


Figure 3. Forward current vs. ambient temperature.

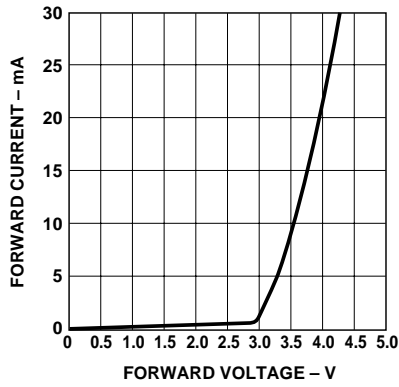


Figure 4. Forward current vs. forward voltage.

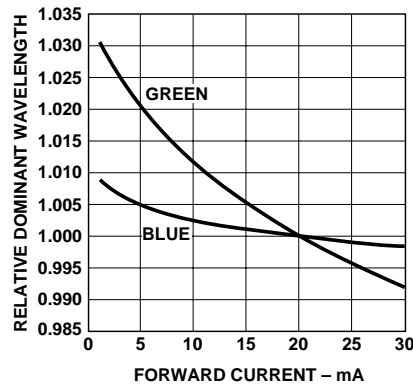


Figure 5. Relative dominant wavelength vs. forward current.

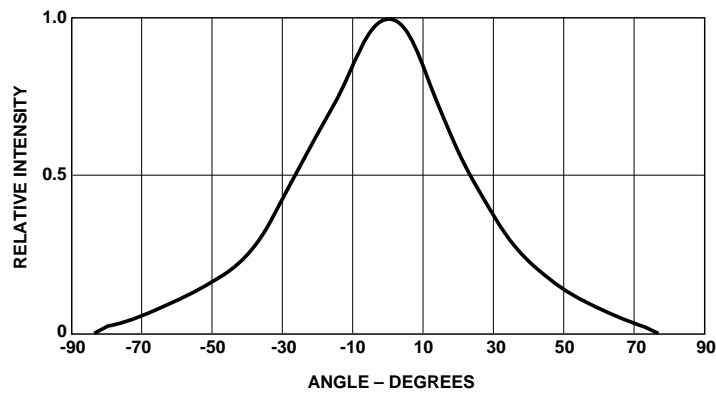


Figure 6. Spatial radiation pattern - minor axis.

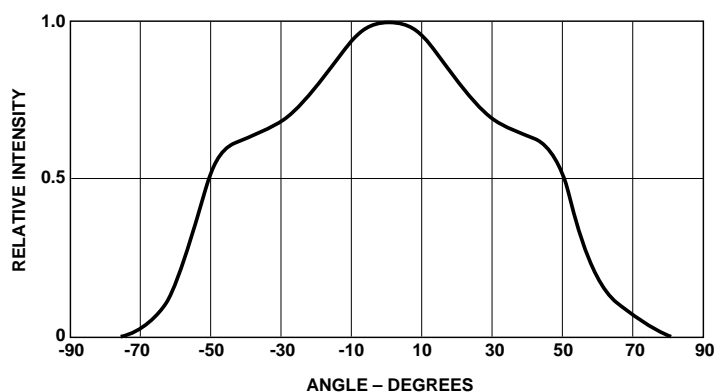


Figure 7. Spatial radiation pattern – major axis.

Intensity Bin Limits (mcd @ 20 mA)

Bin Name	Min.	Max.
F	110	140
G	140	180
H	180	240
J	240	310
K	310	400
L	400	520
M	520	680
N	680	880
P	880	1150
Q	1150	1500
R	1500	1900

Tolerance for each intensity bin limit is $\pm 15\%$.

Color Bin Limits (nm at 20 mA)

Blue	Color Range (nm)	
Bin	Min.	Max.
1	460.0	464.0
2	464.0	468.0
3	468.0	472.0
4	472.0	476.0
5	476.0	480.0

Tolerance for each bin limit is ± 0.5 nm.

Green	Color Range (nm)	
Bin	Min.	Max.
1	520.0	524.0
2	524.0	528.0
3	528.0	532.0
4	532.0	536.0
5	536.0	540.0

Tolerance for each bin limit is ± 0.5 nm.

Note:

1. Bin categories are established for classification of products. Products may not be available in all bin categories.

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For product information and a complete list of distributors, please go to our web site.

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Data subject to change.

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