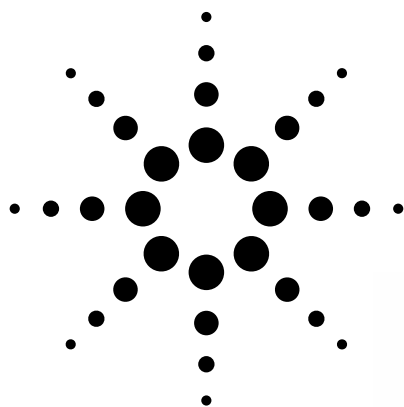




Agilent HLMP-LB11/HLMP-LM11 4 mm Precision Optical Performance InGaN Oval LED Lamps Data Sheet



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

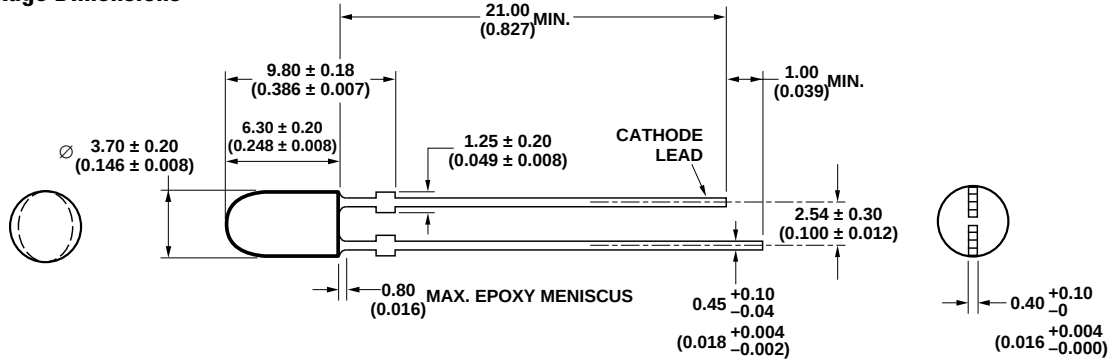
- Full color signs
- Commercial outdoor advertising

Benefits

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



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-HL0xx	Blue 470	180	520	Blue
HLMP-LM11-LP0xx	Green 525	400	1150	Green
HLMP-LM11-NR0xx	Green 525	680	1900	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

HLMP-X X XX - X X X XX

Mechanical Options

- 00: Bulk Packaging
- DD: Ammo Pack

Color Bin Selections

- 0: No color bin limitation

Maximum Intensity Bin

- 0: No I_v bin limitation

Minimum Intensity Bin

Refer to Device Selection Guide

Color

- B: 470 nm Blue
- M: 525 nm Green

Package

- L: 4 mm 50° x 100° Oval

Absolute Maximum Ratings at T_A = 25°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 µA)
LED Junction Temperature	130°C
Operating Temperature Range	–40°C to +80°C
Storage Temperature Range	–40°C to +100°C
Soldering Temperature	260°C for 5 secs

Notes:

1. Derate linearly as shown in Figure 3.
2. Duty Factor 10%, Frequency 1 kHz.

**Electrical /Optical Characteristics Table
T_A = 25°C**

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage						
Blue (λ _d = 470 nm)	V _F		3.8	4.0	V	I _F = 20 mA
Green (λ _d = 525 nm)			3.8	4.0		
Reverse Voltage	V _R	5			V	I _R = 10 µA
Capacitance						
Blue (λ _d = 470 nm)	C		43		pF	V _F = 0, f = 1 MHz
Green (λ _d = 525 nm)			43			
Thermal Resistance	R _{θJ-PIN}		240		°C/W	LED Junction-to-Cathode Lead
Viewing Angle						
Major Axis	2θ _{1/2}		100		deg.	
Minor Axis			50			
Peak Wavelength						
Blue (λ _d = 470 nm)	λ _P		467		nm	Peak of Wavelength of Spectral Distribution at I _F = 20 mA
Green (λ _d = 525 nm)			520			
Spectral Halfwidth						
Blue (λ _d = 470 nm)	Δλ _{1/2}		24		nm	Wavelength Width at Spectral Distribution Power Point at I _F = 20 mA
Green (λ _d = 525 nm)			35			
Luminous Efficacy						
Blue (λ _d = 470 nm)	η _v		75		lm/W	Emitted luminous power/Emitted radiant power
Green (λ _d = 525 nm)			520			

Notes:

1. 2θ_{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/η_v where I_v is the luminous intensity in candelas and η_v is the luminous efficacy in lumens/watt.

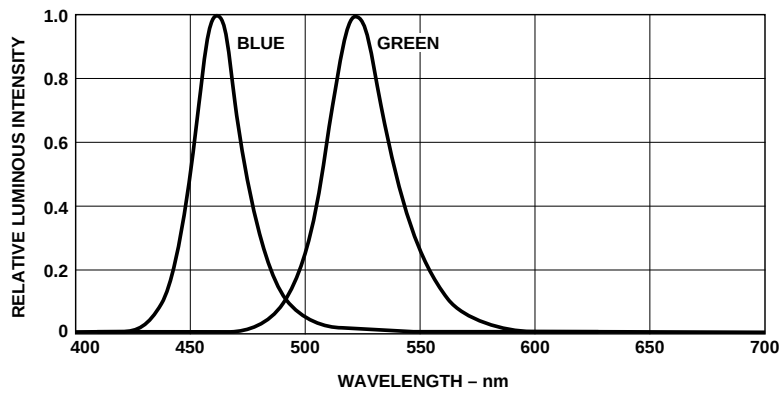


Figure 1. Relative intensity vs wavelength.

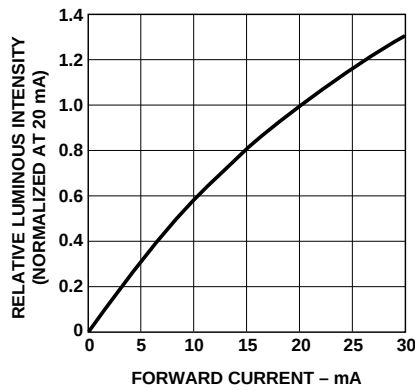


Figure 2. Relative luminous intensity vs. forward current.

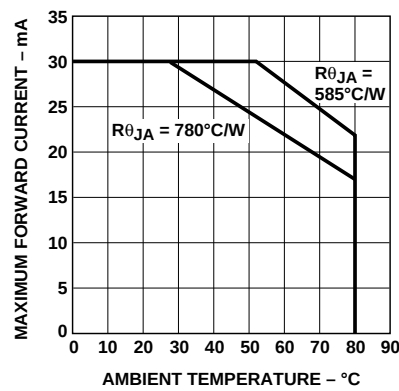


Figure 3. Forward current vs. ambient temperature.

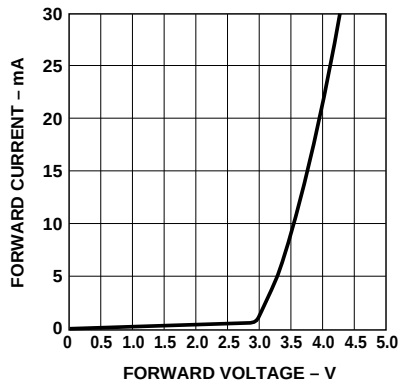


Figure 4. Forward current vs. forward voltage.

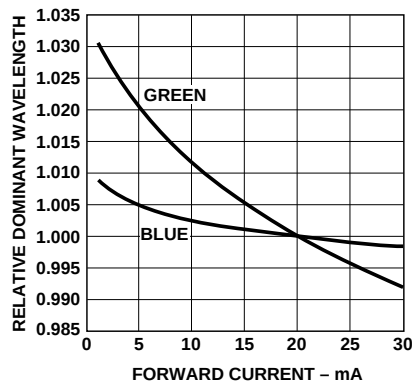


Figure 5. Relative dominant wavelength vs. forward current.

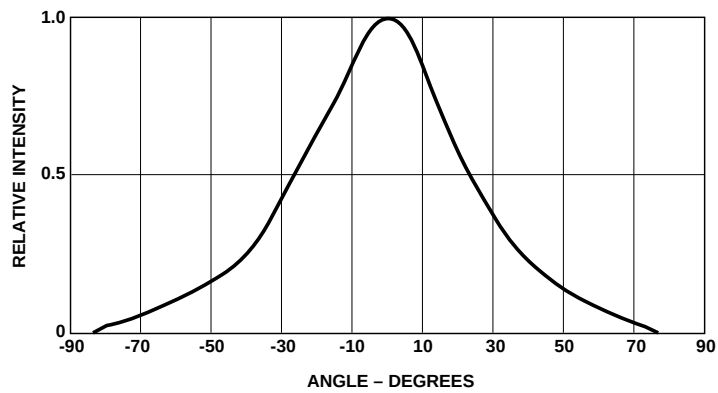


Figure 6. Spatial radiation pattern – minor axis.

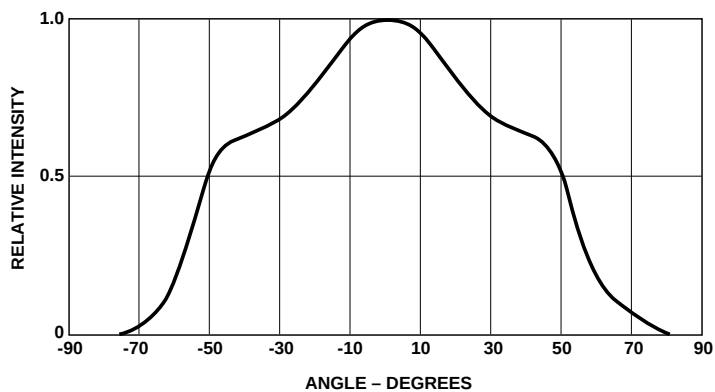


Figure 7. Spatial radiation pattern – major axis.

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.

Note:

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

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.

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Data subject to change.

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