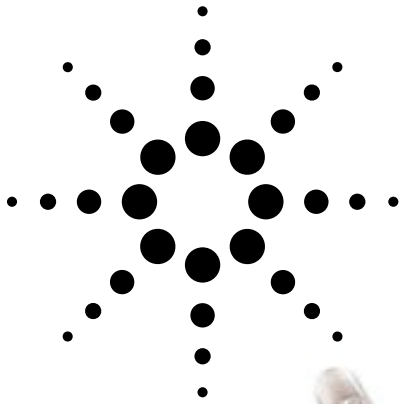


# Agilent Sun Power Series HLMP-CB15, HLMP-CM15, HLMP-CB30, HLMP-CM30 T-1<sup>3</sup>/<sub>4</sub> (5 mm) Precision Optical Performance InGaN Blue and Green Lamps Data Sheet



## Description

These high intensity blue and green LEDs are based on InGaN material technology. InGaN is the most efficient and cost effective material for LEDs in the blue and green region of the spectrum. The 472 nm typical dominant wavelength for blue and 526 nm typical dominant wavelength for green are well suited to color mixing in full color signs.

These LED lamps are untinted, nondiffused, T-1<sup>3</sup>/<sub>4</sub> packages incorporating second generation optics producing well defined spatial radiation patterns at specific viewing cone angles.

These lamps are made with an advanced optical grade epoxy, offering superior high temperature and high moisture resistance performance in outdoor signal and sign applications. The high maximum LED junction temperature limit of +130°C enables high temperature operation in bright sunlight conditions. The package epoxy contains both UV-A and UV-B inhibitors to reduce the effects of long term exposure to direct sunlight.

These lamps are available in two viewing angle options to give the designer flexibility with optical design.

## Features

- Well defined spatial radiation pattern
- Viewing angles: 15° and 30°
- High luminous output
- Colors: 472 nm Blue, 526 nm Green
- Superior resistance to moisture
- UV resistant epoxy

## Benefits

- Superior performance in outdoor environments
- Wavelengths suitable for color mixing in full color (RGB) signs

## Applications

- Commercial outdoor signs
- Automotive interior lights
- Front panel indicators
- Front panel backlighting

**CAUTION:** HLMP-CBxx and HLMP-CMxx LEDs are Class 1 ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Agilent Application Note AN-1142 for additional details.

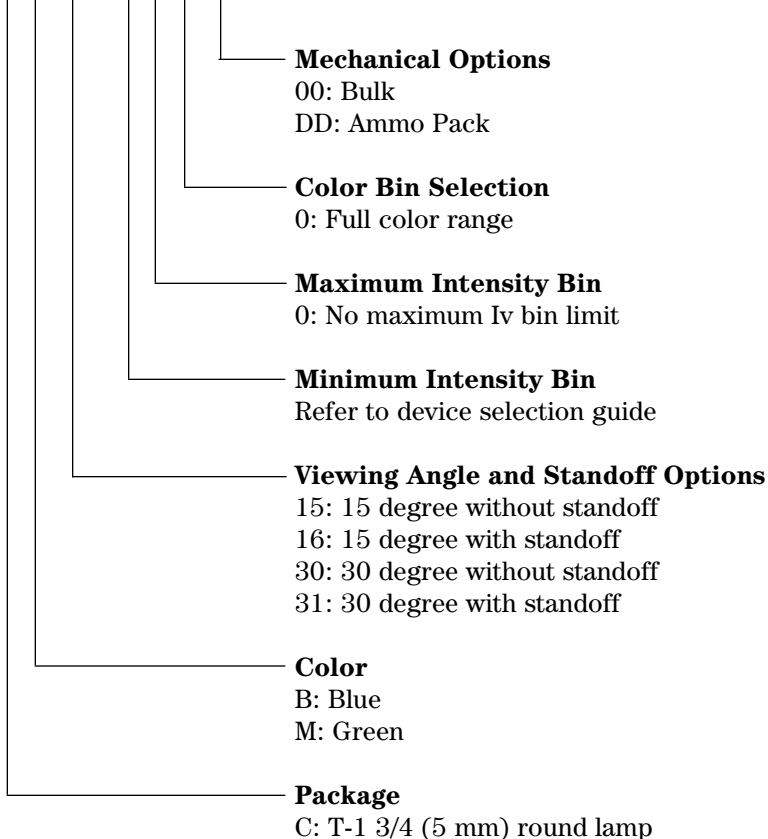
## LED Indicators

### Device Selection Guide

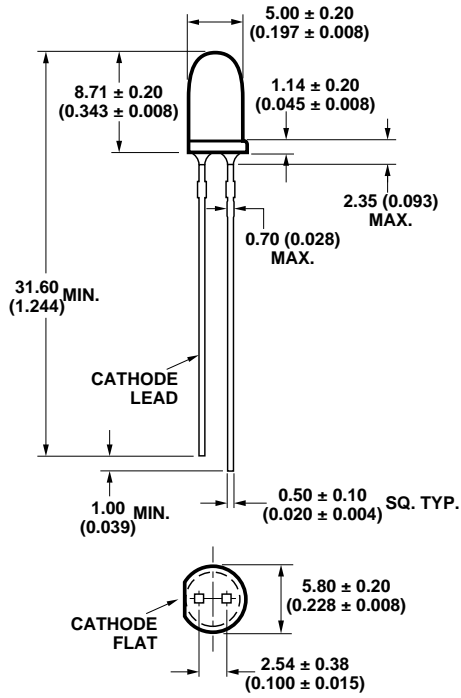
Part Number	Typical Viewing Angle	Color and Dominant Wavelength $\lambda_d$ (nm) Typ.	Luminous Intensity, $I_v$ (mcd) Min.	Leads with Stand-Offs	Package Drawing
HLMP-CB15-P00xx	15°	Blue 472	880	No	A
HLMP-CB15-R00xx	15°	Blue 472	1500	No	A
HLMP-CB16-P00xx	15°	Blue 472	880	Yes	B
HLMP-CB30-K00xx	30°	Blue 472	310	No	A
HLMP-CB30-M00xx	30°	Blue 472	520	No	A
HLMP-CB31-M00xx	30°	Blue 472	520	Yes	B
HLMP-CM15-S00xx	15°	Green 526	1900	No	A
HLMP-CM15-W00xx	15°	Green 526	5500	No	A
HLMP-CM16-S00xx	15°	Green 526	1900	Yes	B
HLMP-CM30-M00xx	30°	Green 526	520	No	A
HLMP-CM30-S00xx	30°	Green 526	1900	No	A
HLMP-CM31-M00xx	30°	Green 526	520	Yes	B

### Part Numbering System

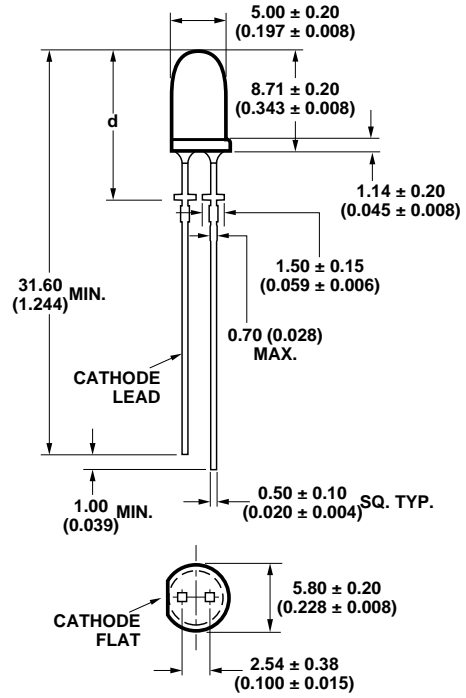
HLMP - X X XX - X X X XX



# Package Dimensions



HLMP-Cx15 and HLMP-Cx30



HLMP-Cx16 and HLMP-Cx31

HLMP-Cx16	HLMP-Cx31
d = 12.60 ± 0.25 (0.496 ± 0.010)	d = 12.22 ± 0.50 (0.481 ± 0.020)

## Notes:

1. Dimensions in mm.
2. Tolerance ±0.1 mm unless otherwise noted.

**Absolute Maximum Ratings at T<sub>A</sub> = 25°C**

Parameter	Blue and Green
DC Forward Current <sup>[1]</sup>	30 mA
Peak Pulsed Forward Current	100 mA
Average Forward Current	30 mA
Reverse Voltage (I <sub>R</sub> = 100 μA)	5 V
Power Dissipation	120 mW
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 seconds

**Note:**

1. Derate linearly as shown in Figure 5 for temperatures above 50°C.

**Electrical/Optical Characteristics at T<sub>A</sub> = 25°C**

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage						
HLMP-CB1x-P0000	V <sub>F</sub>		3.8	4.0	V	I <sub>F</sub> = 20 mA
HLMP-CB15-R0000			3.5	4.0		
HLMP-CB3x-K0000			3.8	4.0		
HLMP-CB3x-M0000			3.8	4.0		
HLMP-CM1x-S0000			3.8	4.0		
HLMP-CM15-W0000			3.5	4.0		
HLMP-CM3x-M0000			3.8	4.0		
HLMP-CM30-S0000			3.5	4.0		
Reverse Voltage	V <sub>R</sub>	5				I <sub>R</sub> = 100 μA
Peak Wavelength						
Blue (λ <sub>d</sub> = 472 nm)	λ <sub>peak</sub>		470		nm	Peak of Wavelength of Spectral Distribution at I <sub>F</sub> = 20 mA
Green (λ <sub>d</sub> = 526 nm)			524			
Spectral Halfwidth						
Blue (λ <sub>d</sub> = 472 nm)	Δλ <sub>1/2</sub>		35		nm	Wavelength Width at Spectral Power Point at I <sub>F</sub> = 20 mA
Green (λ <sub>d</sub> = 526 nm)			47			
Capacitance	C		43		pF	V <sub>F</sub> = 0, F = 1 MHz
Luminous Efficacy						
Blue (λ <sub>d</sub> = 472 nm)	η <sub>v</sub>		75		lm/W	Emitted Luminous Power/Emitted Radiant Power
Green (λ <sub>d</sub> = 526 nm)			520			
Thermal Resistance	R <sub>ΘJ-PIN</sub>		240		°C/W	LED Junction-to-Cathode Lead

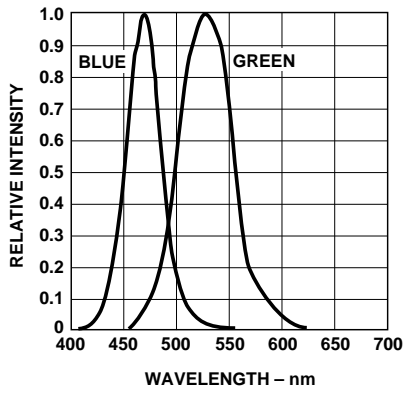


Figure 1. Relative intensity vs. wavelength.

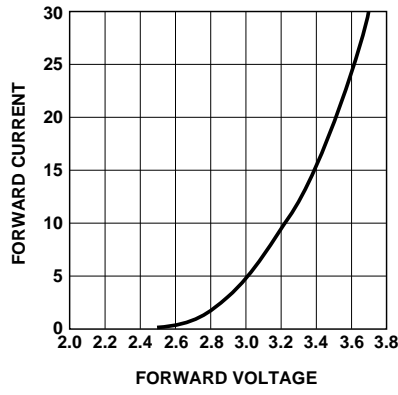


Figure 2. Forward current vs. forward voltage (for HLMP-CB15-R0000, HLMP-CM15-W0000 and HLMP-CM30-S0000).

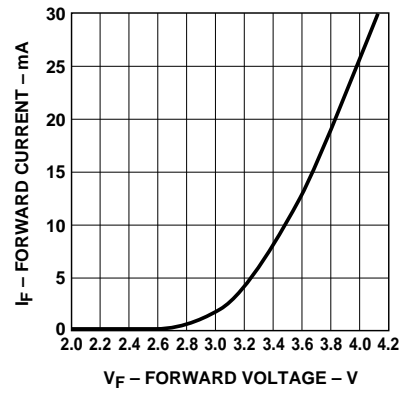


Figure 3. Forward current vs. forward voltage (for HLMP-CB1x-P0000, HLMP-CB30-K0000, HLMP-CB3x-M0000, HLMP-CM1x-S0000 and HLMP-CM3x-M0000).

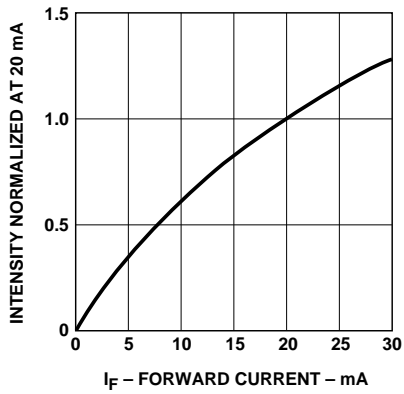


Figure 4. Relative luminous intensity vs. forward current.

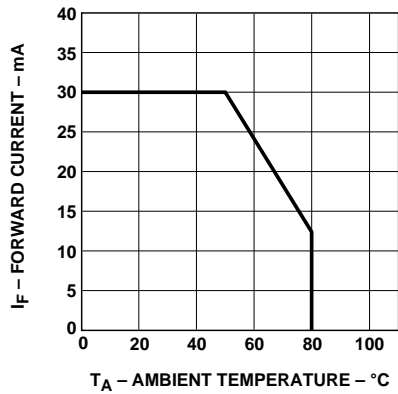


Figure 5. Maximum forward current vs. ambient temperature.

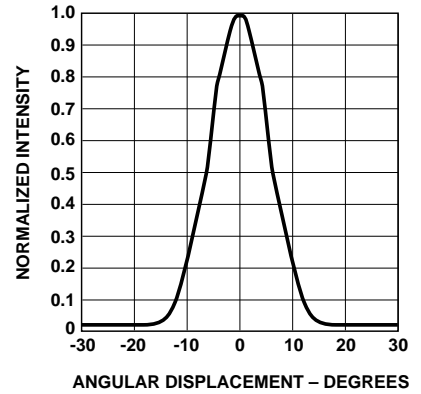


Figure 6. Spatial radiation pattern - 15° lamps.

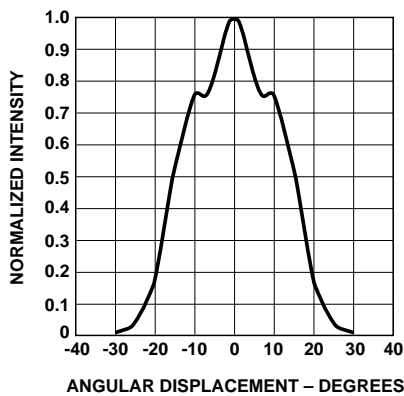


Figure 7. Spatial radiation pattern - 30° lamps.

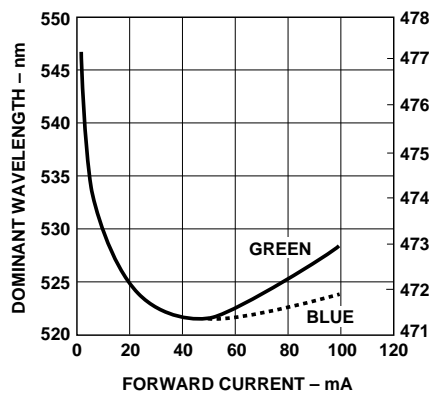


Figure 8. Color vs. forward current.

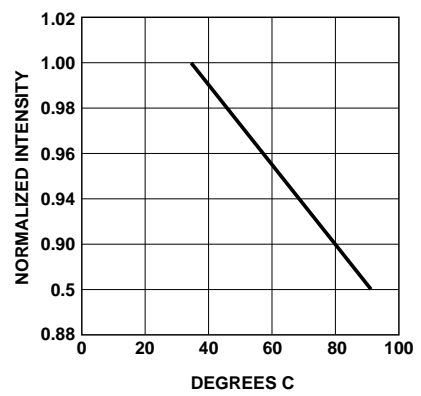


Figure 9. Normalized  $I_v$  vs.  $T$  (green).

**Color Bin Limits (nm at 20 mA)**

<b>Blue</b>	<b>Color Range (nm)</b>	
<b>Bin ID</b>	<b>Min.</b>	<b>Max.</b>
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  $\pm 0.5$  nm.

<b>Green</b>	<b>Color Range (nm)</b>	
<b>Bin ID</b>	<b>Min.</b>	<b>Max.</b>
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  $\pm 0.5$  nm.

**Intensity Bin Limits**

<b>Bin Name</b>	<b>Min.</b>	<b>Max.</b>
K	310	400
L	400	520
M	520	680
N	680	880
P	880	1150
Q	1150	1500
R	1500	1900
S	1900	2500
T	2500	3200
U	3200	4200
V	4200	5500
W	5500	7200

Tolerance of each minimum and maximum is  $\pm 15\%$ .

**Note:**

1. All bin categories are established for classification of products. Products may not be available in all bin categories. Please contact your Agilent representatives for further information.

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