

# 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 Best Value 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.



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## LED Indicators

### Drive 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
HLMP-CB15-P0000	15°	Blue 472	765	No
HLMP-CB15-R0000	15°	Blue 472	1300	No
HLMP-CB30-K0000	30°	Blue 472	270	No
HLMP-CB30-M0000	30°	Blue 472	450	No
HLMP-CM15-S0000	15°	Green 526	1650	No
HLMP-CM15-W0000	15°	Green 526	4700	No
HLMP-CM30-M0000	30°	Green 526	450	No
HLMP-CM30-S0000	30°	Green 526	1650	No

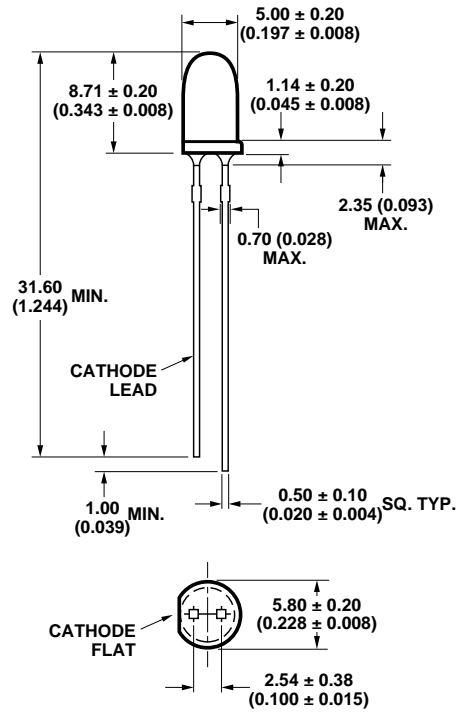
### Absolute Maximum Ratings at $T_A = 25^\circ\text{C}$

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 ( $I_R = 100 \mu\text{A}$ )	5 V
Power Dissipation	120 mW
LED Junction Temperature	100°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 4 for temperatures above 50°C.

## Package Dimensions



**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).

### Electrical/Optical Characteristics at $T_A = 25^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage	$V_F$		3.5	4.0	V	$I_F = 20 \text{ mA}$
Reverse Voltage	$V_R$	5			V	$I_R = 100 \mu\text{A}$
Peak Wavelength						Peak of Wavelength of Spectral Distribution at $I_F = 20 \text{ mA}$
Blue ( $\lambda_d = 472 \text{ nm}$ )	$\lambda_{\text{peak}}$		470		nm	
Green ( $\lambda_d = 526 \text{ nm}$ )			524			
Spectral Halfwidth						Wavelength Width at Spectral Distribution 1/2 Power Point at $I_F = 20 \text{ mA}$
Blue ( $\lambda_d = 472 \text{ nm}$ )	$\Delta\lambda_{1/2}$		35		nm	
Green ( $\lambda_d = 526 \text{ nm}$ )			47			
Capacitance	C		43		pF	$V_F = 0, F = 1 \text{ MHz}$
Luminous Efficacy						Emitted Luminous Power/Emitted Radiant Power at $I_F = 20 \text{ mA}$
Blue ( $\lambda_d = 472 \text{ nm}$ )	$\eta_v$		75		lm/W	
Green ( $\lambda_d = 526 \text{ nm}$ )			520			
Thermal Resistance	$R_{\Theta J-PIN}$		240		$^\circ\text{C/W}$	LED Junction-to-Cathode Lead

**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  $\eta_v$  is the luminous efficacy in lumens/watt.
3. The luminous intensity is measured on the mechanical axis of the lamp package.
4. The optical axis is closely aligned with the package mechanical axis.
5. The dominant wavelength,  $\lambda_d$ , is derived from the CIE Chromaticity Diagram and represents the color of the lamp.

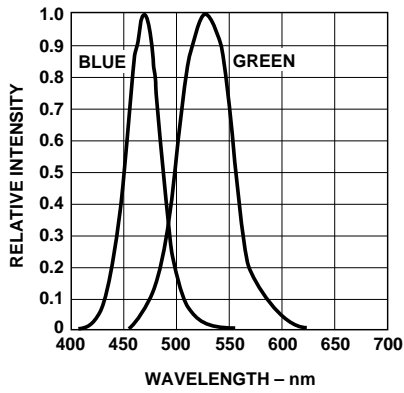


Figure 1. Relative intensity vs. wavelength.

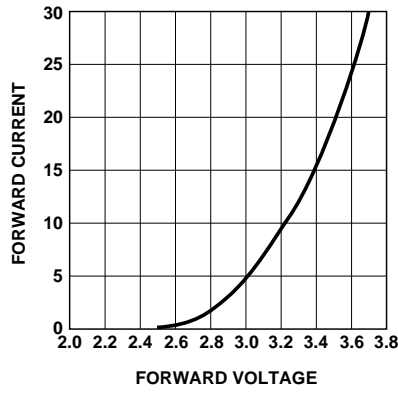


Figure 2. Forward current vs. forward voltage.

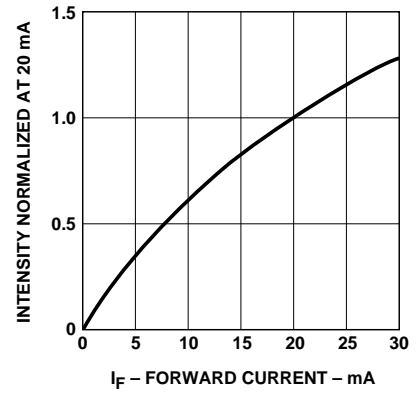


Figure 3. Relative luminous intensity vs. forward current.

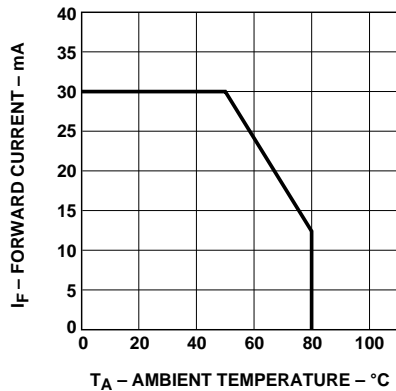


Figure 4. Maximum forward current vs. ambient temperature.

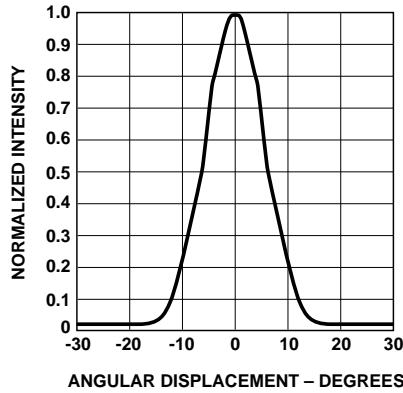


Figure 5. Spatial radiation pattern - 15° lamps.

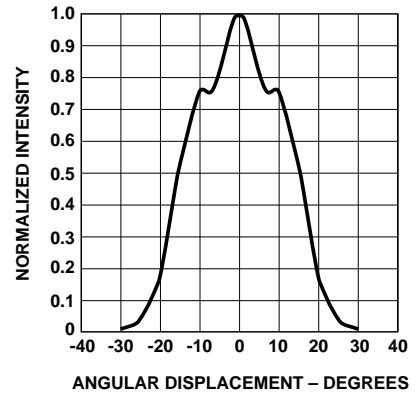


Figure 6. Spatial radiation pattern - 30° lamps.

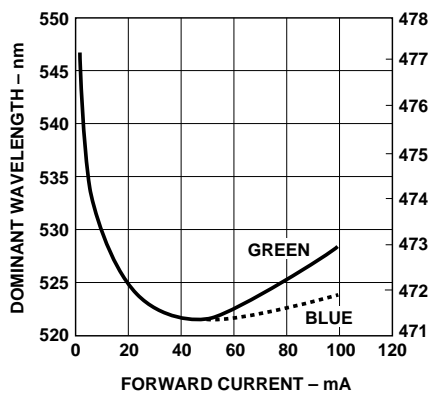


Figure 7. Color vs. forward current.

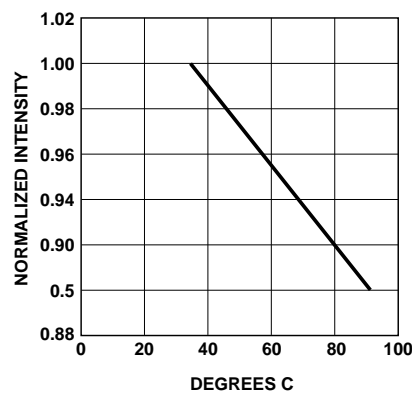


Figure 8. Normalized  $I_v$  vs.  $T$  (green).

#### Intensity Bin Limits

Bin Name	Min.	Max.
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  $\pm 15\%$ .

