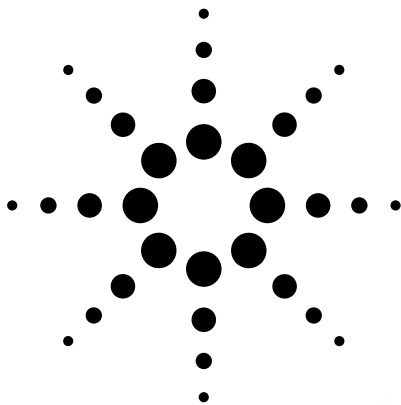


Agilent HLMP-CWxx T-1³/₄ Precision Optical Performance White LED Lamps

Data Sheet



**HLMP-CW15, HLMP-CW16, HLMP-CW23, HLMP-CW24,
HLMP-CW30, HLMP-CW31**

Description

These high intensity white LED lamps are based on InGaN material technology. A blue LED die is coated by a phosphor to produce white. The typical resulting color is described by the coordinates $x = 0.32$, $y = 0.32$ using the 1931 CIE Chromaticity Diagram.

These T-1³/₄ lamps are untinted, nondiffused, and incorporate precise optics producing well defined spatial radiation patterns at specific viewing cone angle.

Features

- Highly luminous white emission
- 15°, 23°, and 30° viewing angle

Applications

- Electronic signs and signals
- Small area illumination
- Legend backlighting
- General purpose indicators

Benefit

- Reduced power consumption, higher reliability, and increased optical/mechanical design flexibility compared to incandescent bulbs and other alternative white light sources

CAUTION: These devices are Class 2 ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Agilent Technologies Application Note AN-1142 for additional details.



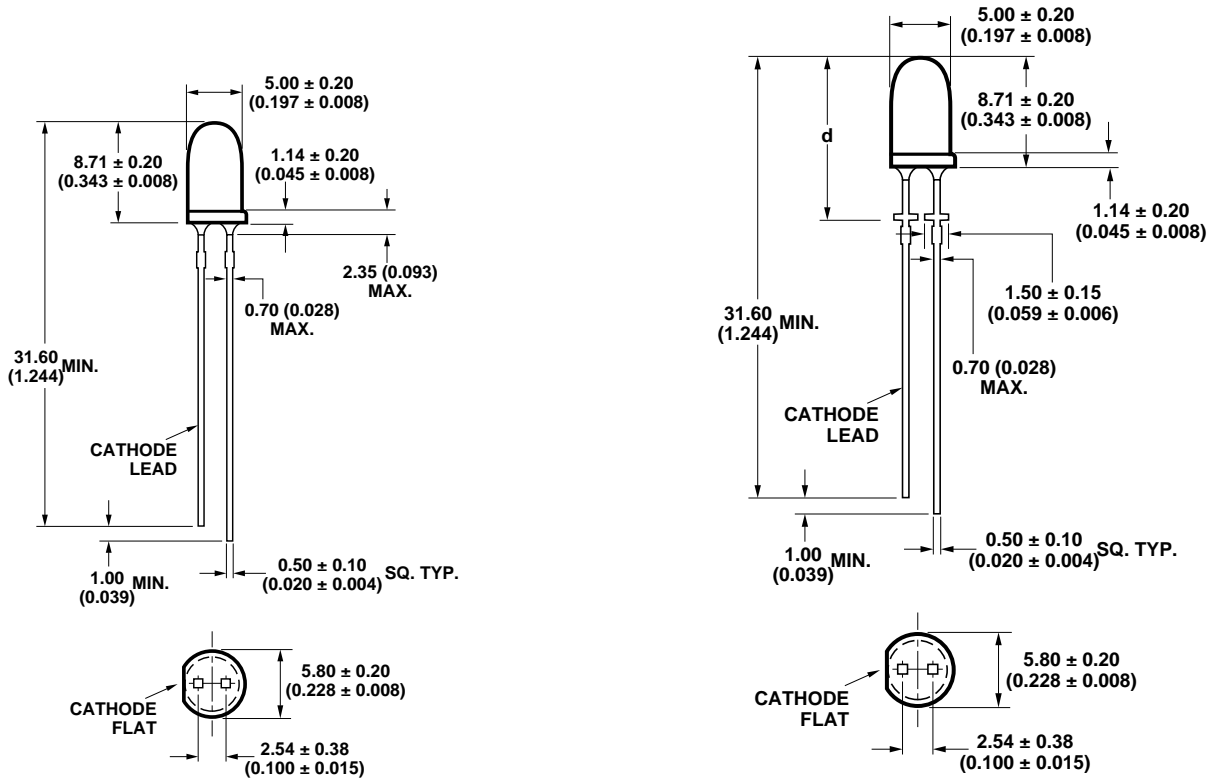
Agilent Technologies

Device Selection Guide

Part Number	Viewing Angle Typ.	Min. Luminous Intensity I _v (mcd) @ 20 mA		Standoff Leads	Package Dimension
		Min.	Max.		
HLMP-CW15-TW0xx	15°	2500	7200	No	A
HLMP-CW15-VY0xx	15°	4200	12000	No	A
HLMP-CW16-TW0xx	15°	2500	7200	Yes	B
HLMP-CW16-VY0xx	15°	4200	12000	Yes	B
HLMP-CW23-SV0xx	23°	1900	5500	No	A
HLMP-CW23-TW0xx	23°	2500	7200	No	A
HLMP-CW24-SV0xx	23°	1900	5500	Yes	B
HLMP-CW24-TW0xx	23°	2500	7200	Yes	B
HLMP-CW30-PS0xx	30°	880	2500	No	A
HLMP-CW30-SV0xx	30°	1900	5500	No	A
HLMP-CW31-PS0xx	30°	880	2500	Yes	B
HLMP-CW31-SV0xx	30°	1900	5500	Yes	B

Tolerance for each intensity limit is ± 15%.

Package Dimensions



PACKAGE DIMENSION A

PACKAGE DIMENSION B

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. EPOXY MENISCUS MAY EXTEND ABOUT 1 mm (0.040") DOWN THE LEADS.

HLMP-CW16	HLMP-CW24	HLMP-CW31
d = 12.6 ± 0.25 (0.496 ± 0.010)	d = 12.52 ± 0.25 (0.493 ± 0.010)	d = 11.96 ± 0.25 (0.471 ± 0.010)

Part Numbering System

HLMP - CW_{xx} - x x x xx

Mechanical Option

- 00: Bulk
- DD: Ammo Pack

Color Bin Option

- 0: Full color bin distribution

Maximum Intensity Bin Limit

- 0: No maximum intensity bin limit

Minimum Intensity Bin Limit

Refer to Device Selection Guide

Viewing Angle and Standoff Option

- 15: 15° without standoffs
- 16: 15° with standoffs
- 23: 23° without standoffs
- 24: 23° with standoffs
- 30: 30° without standoffs
- 31: 30° with standoffs

Absolute Maximum Ratings

T_A = 25°C

Parameter	Value	Units
DC Forward Current ^[1]	30	mA
Peak Forward Current ^[2]	100	mA
Power Dissipation	120	mW
Reverse Voltage (I _R = 10 μA)	5	V
LED Junction Temperature	110	°C
Operating Temperature Range	-40 to +80	°C
Storage Temperature Range	-40 to +100	°C
Wave Solder Temperature ^[3]	250 for 3 secs	°C

Notes:

1. Derate linearly as shown in Figure 5.
2. Duty factor 10%, 1 kHz.
3. 1.59 mm (0.060 inch) below body.

Electrical Characteristics

T_A = 25°C

Forward Voltage, V _F (V) @ I _F = 20 mA		Reverse Breakdown, V _R (V) @ I _R = 10 μA	Capacitance, C (pF), V _F = 0, f = 1 MHz	Thermal Resistance R _{θJ-PIN} (°C/W)
Typ.	Max.	Min.	Typ.	Typ.
3.6	4.0	5	70	240

Optical Characteristics

T_A = 25°C

Part Number	Typical Chromaticity Coordinates ^[1]		Viewing Angle 2θ _{1/2} Degrees ^[2]
	X	Y	Typ.
HLMP-CW3x-xxxxx	0.32	0.32	30
HLMP-CW2x-xxxxx	0.32	0.32	23
HLMP-CW1x-xxxxx	0.32	0.32	15

Notes:

1. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent the perceived color of the device.
2. θ_{1/2} is the off-axis angle where the luminous intensity is ½ the peak intensity.

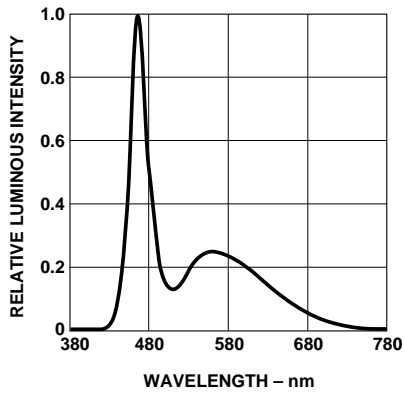


Figure 1. Relative intensity vs. wavelength.

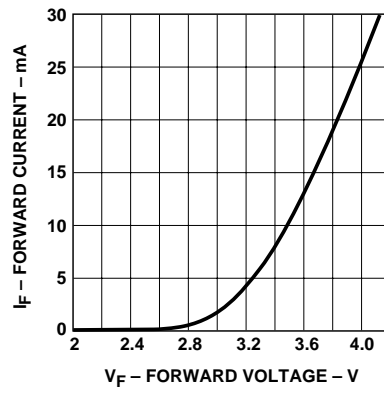


Figure 2. Forward current vs. forward voltage.

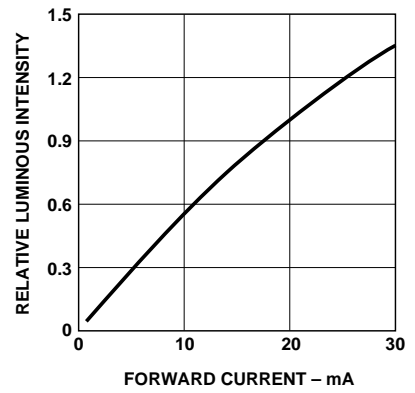


Figure 3. Relative intensity vs. forward current.

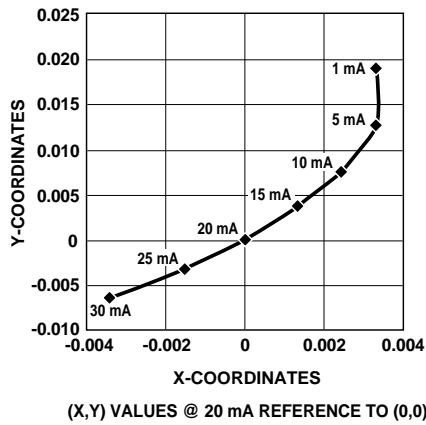


Figure 4. Chromaticity shift vs. current.

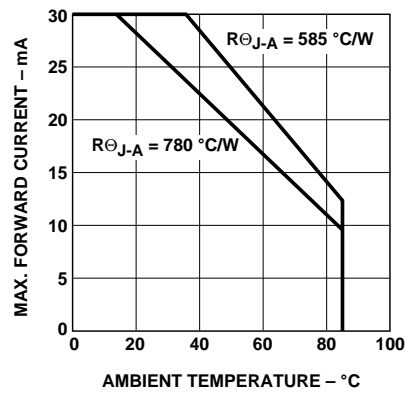


Figure 5. Maximum forward current vs. temperature.

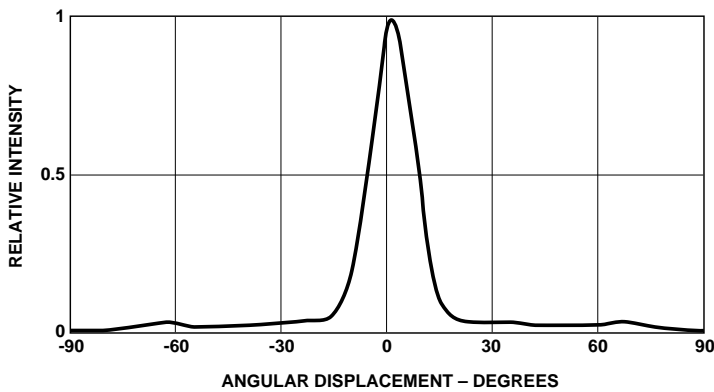


Figure 6a. CW1x spatial radiation pattern.

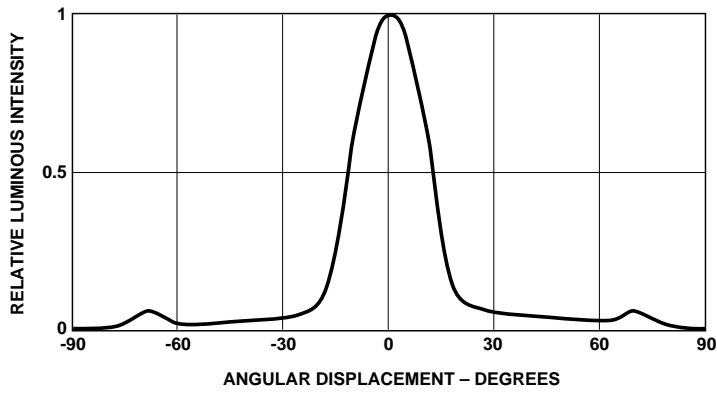


Figure 6b. CW2x spatial radiation pattern.

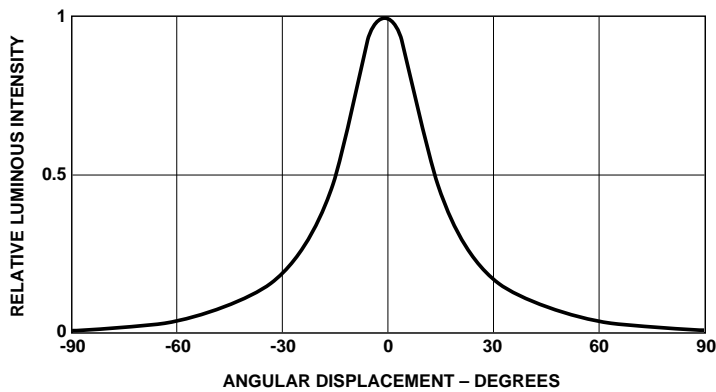


Figure 6c. CW3x spatial radiation pattern.

Intensity Bin Limits (mcd at 20 mA)

Bin	Min.	Max.
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
X	7200	9300
Y	9300	12000
Z	12000	16000

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

Color Bin Limit Table

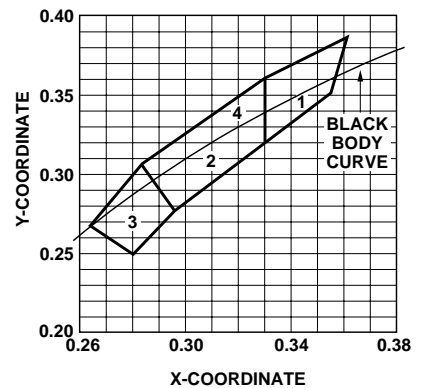
Rank	Limits (Chromaticity Coordinates)				
1	x	0.330	0.330	0.356	0.361
	y	0.360	0.318	0.351	0.385
2	x	0.287	0.296	0.330	0.330
	y	0.295	0.276	0.318	0.339
3	x	0.264	0.280	0.296	0.283
	y	0.267	0.248	0.276	0.305
4	x	0.283	0.287	0.330	0.330
	y	0.305	0.295	0.339	0.360

Tolerance for each bin limit is ± 0.01 .

Note:

Bin categories are established for classification of products. Products may not be available in all bin categories. Please contact your Agilent representative for information on currently available bins.

Color Bin Limits with Respect to CIE 1931 Chromaticity Diagram



www.agilent.com/semiconductors

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

For technical assistance call:

Americas/Canada: +1 (800) 235-0312 or (916) 788-6763

Europe: +49 (0) 6441 92460

China: 10800 650 0017

Hong Kong: (+65) 6756 2394

India, Australia, New Zealand: (+65) 6755 1939

Japan: (+81 3) 3335-8152 (Domestic/International), or 0120-61-1280 (Domestic Only)

Korea: (+65) 6755 1989

Singapore, Malaysia, Vietnam, Thailand, Philippines, Indonesia: (+65) 6755 2044

Taiwan: (+65) 6755 1843

Data subject to change.

Copyright © 2004 Agilent Technologies, Inc.

June 9, 2004

5988-9537EN