



Agilent T-1 $\frac{3}{4}$ (5mm) Extra Bright Precision Optical Performance White LED Lamps. Data Sheet

HLMP-CW46, HLMP-CW47, HLMP-CW76, HLMP-CW77

Description

These high intensity white LED lamps are based on InGaN material technology. A blue LED die is coated by phosphor to produce white. The typical resulting color is described by the coordinates $x = 0.31$, $y = 0.31$ using the 1931 CIE Chromaticity Diagram.

These T-1 $\frac{3}{4}$ lamps are untinted, diffused, and incorporate precise optics which produce well-defined spatial radiation patterns at specific viewing cone angle.

Features

- Well defined spatial radiation pattern
- High luminous white emission
- Viewing angle: 50° and 70°.
- Standoff or non-standoff leads
- Superior resistance to moisture

Applications

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

Benefit

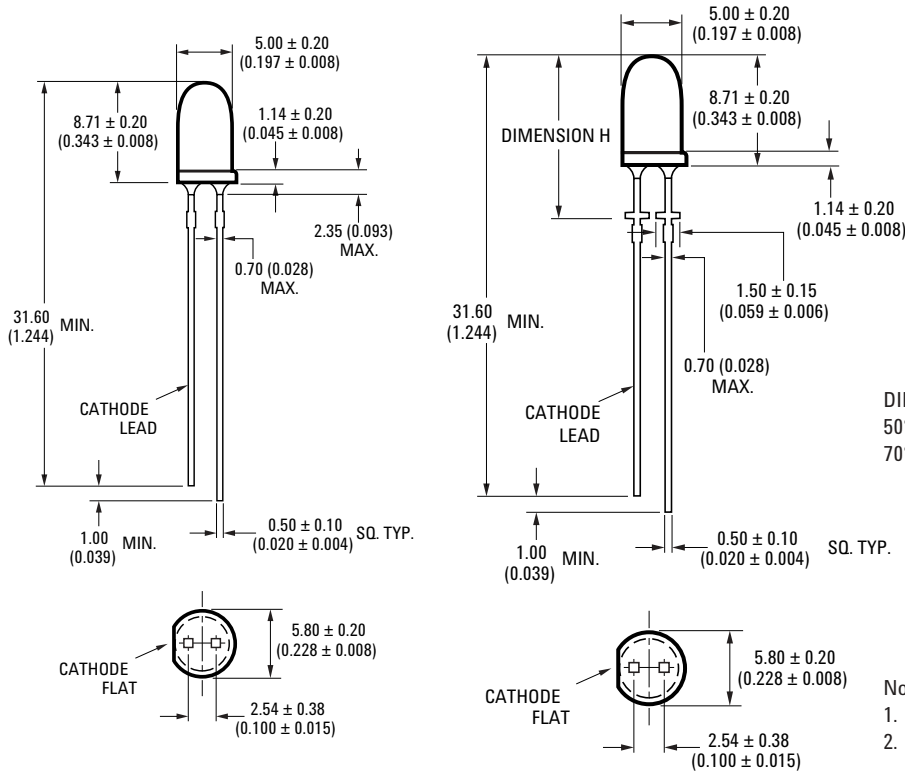
- Reduced power consumption, higher reliability, and increased optical/mechanical design flexibility compared to incandescent bulbs and other alternative white light sources.

Caution: Devices are Class 1 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



DIMENSION H:
 $50^\circ: 11.98 \pm 0.25\text{mm}$ (0.4715 ± 0.01 inches)
 $70^\circ: 11.09 \pm 0.25\text{mm}$ (0.4365 ± 0.01 inches)

Notes:

1. All dimensions are in millimeters / inches.
2. Epoxy meniscus may extend about 1mm (0.040") down the leads.
3. If heat-sinking application is required, the terminal for heat sink is anode.

Package Dimension A

Package Dimension B

Part Numbering System

H L M P - C W XX - X X X XX

Mechanical Option

00: Bulk
 DD: Ammo Pack Straight Leads

Color Bin Options

0: Full color bin distribution
 B: Color bin 2 & 3 only

Maximum Intensity Bin

0: No maximum intensity bin limit
 Others: Refer to Device Selection Guide

Minimum Intensity Bin

Refer to Device Selection Guide

Viewing Angle and Standoff Option

46: 50° without standoff
 47: 50° with standoff
 76: 70° without standoff
 77: 70° with standoff

Device Selection Guide

Part Number	Typical Viewing Angle, 2θ ½ (Degree)	Intensity (mcd) at 20 MA		Standoff	Package Dimension
		Min.	Max.		
HLMP-CW46-PS0xx	50	880	2500	No	A
HLMP-CW46-QR0xx	50	1150	1900	No	A
HLMP-CW46-QRBxx	50	1150	1900	No	A
HLMP-CW47-PS0xx	50	880	2500	Yes	B
HLMP-CW47-QR0xx	50	1150	1900	Yes	B
HLMP-CW47-QRBxx	50	1150	1900	Yes	B
HLMP-CW76-NR0xx	70	680	1900	No	A
HLMP-CW76-PQ0xx	70	880	1500	No	A
HLMP-CW76-PQBxx	70	880	1500	No	A
HLMP-CW77-NR0xx	70	680	1900	Yes	B
HLMP-CW77-PQ0xx	70	880	1500	Yes	B
HLMP-CW77-PQBxx	70	880	1500	Yes	B

Notes:

1. Tolerance for luminous intensity measurement is +/- 15%
2. The luminous intensity is measured on the mechanical axis of the lamp package.
3. The optical axis is closely aligned with the package mechanical axis.
4. 2θ_{1/2} is the off-axis angle where the luminous intensity is ½ the on axis intensity

Absolute Maximum Rating at T_A = 25°C

Parameters	Value	Unit
DC forward current ^[1]	30	mA
Peak pulsed forward current ^[2]	100	mA
Average forward current	30	mA
Power dissipation	105	mW
LED junction temperature	110	°C
Operating temperature range	-40 to +85	°C
Storage temperature range	-40 to +100	°C
Wave soldering temperature ^[3]	250 for 3 seconds	°C

Notes:

1. Derate linearly as shown in figure 2.
2. Duty factor 10%, frequency 1KHz
3. 1.59 mm (0.060 inch) below body

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

Parameters	Symbol	Min	Typ	Max	Units	Test Condition
Forward voltage	V_F		3.2	4.0	V	$I_F = 20 \text{ mA}$
Reverse Voltage ^[1]	V_R	5.0			V	$I_R = 10 \mu\text{A}$
Thermal resistance	$R\theta_{J-PIN}$		240		$^\circ\text{C}/\text{W}$	LED Junction to anode lead
Chromaticity Coordinates ^[2]	X Y		0.31 0.31			$I_F = 20 \text{ mA}$
Capacitance	C		70			$V_F=0, f=1\text{MHz}$

Notes:

- The reverse voltage of the product is equivalent to the forward voltage of the protective chip at $I_R = 10 \mu\text{A}$
- The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent the perceived color of the device.

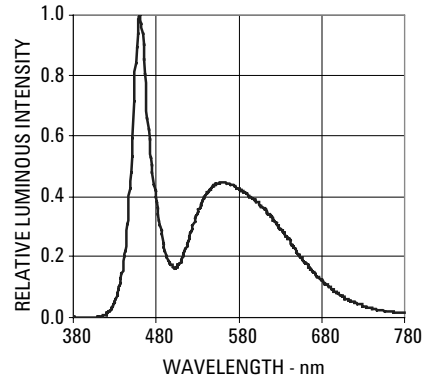


Figure 1. Relative Intensity vs. Wavelength

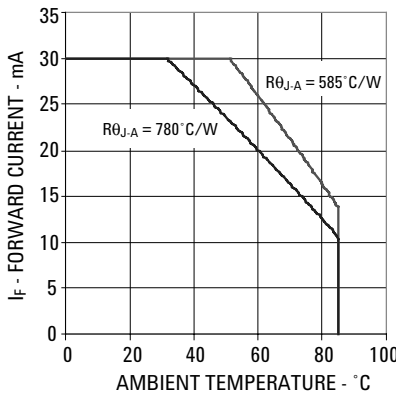


Figure 2. Forward Current vs. Ambient Temperature

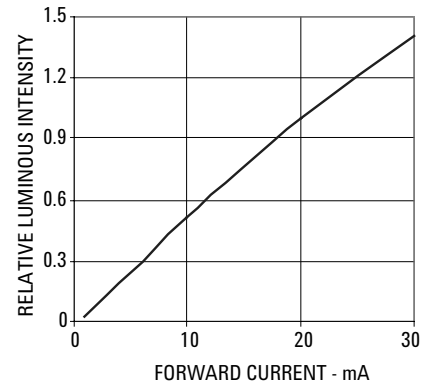


Figure 3. Relative Intensity versus DC Forward Current

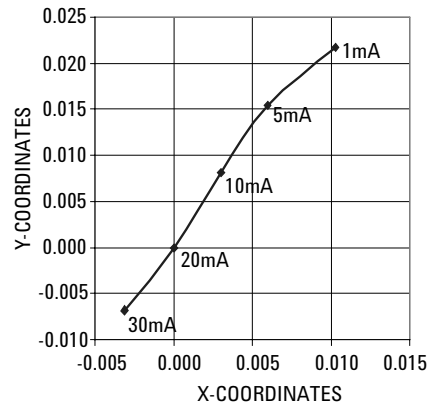


Figure 4. Chromaticity shift vs. Current

*Note: (x,y) values @ 20mA reference to (0,0)

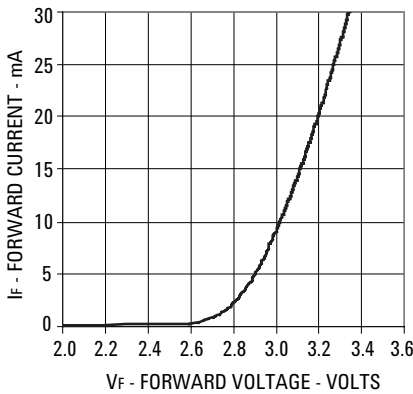


Figure 5. Forward Current vs. Forward Voltage

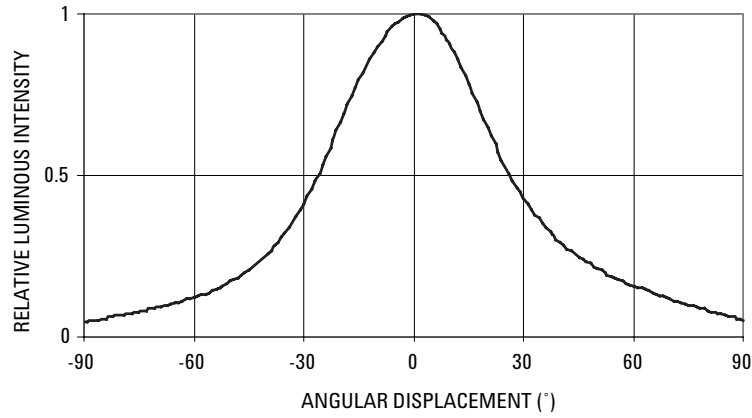


Figure 6. Spatial Radiation Pattern for CW4x

Intensity Bin Limit Table

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

Bin	Intensity (mcd) at 20 mA	
	Min	Max
N	680	880
P	880	1150
Q	1150	1500
R	1500	1900
S	1900	2500

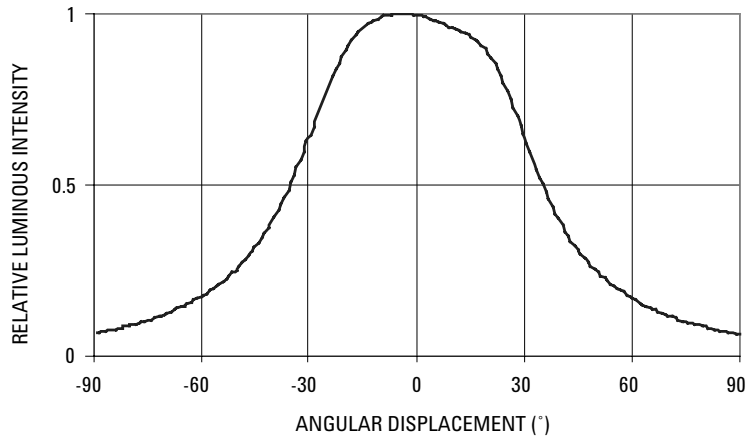


Figure 7. Spatial Radiation Pattern for CW7x

Color Bin Limit Table

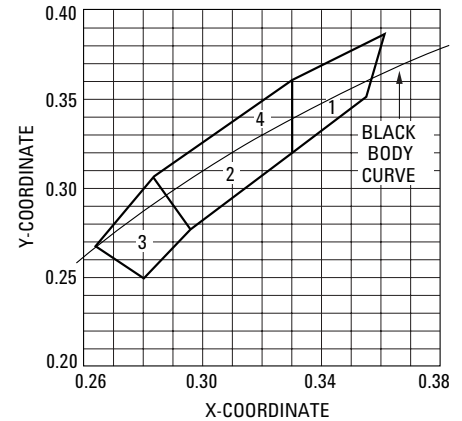
Tolerance for each bin limit is ± 0.01

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

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.

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Data subject to change.

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