

# Agilent HLMP-CW18, HLMP-CW19, HLMP-CW28, HLMP-CW29, HLMP-CW38, HLMP-CW39 T-1 3/4 Precision Optical Performance White LED Data Sheet

# 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

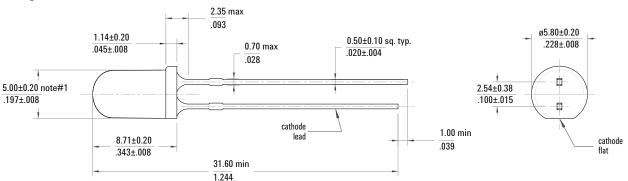
### **Description**

These Super Bright Precision Optical Performance LED lamps are based on flip chip InGaN material, which is the brightest and most efficient technology for LEDs. A blue LED die is coated by a phosphor to produce white. These T-1 3/4 lamps incorporate precise optics producing well-defined spatial radiation patterns at specific viewing cone angle.

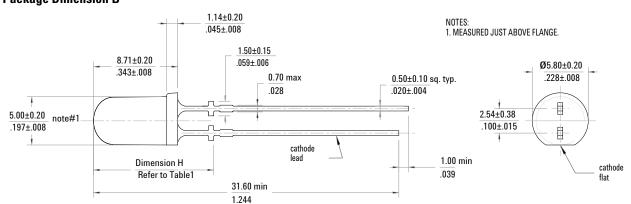
# **Features**

- Highly Luminous White Emission
- $\cdot$  15 °, 23 °, and 30° viewing angle
- New InGaN flip chip die technology with protective diode.
- · ESD class 3

# **Package Dimension A**



# Package Dimension B



Dimension H:

23 & 30 Degree = 12.67 +/- 0.25 mm (0.499 +/- 0.01 inch) 15 Degree = 12.93 +/- 0.25 mm (0.509 +/- 0.01 inch) Notes:

- 1. All dimensions are in milimetres /inches.
- 2. Epoxy meniscus may extend about 1mm (0.040") down the leads.

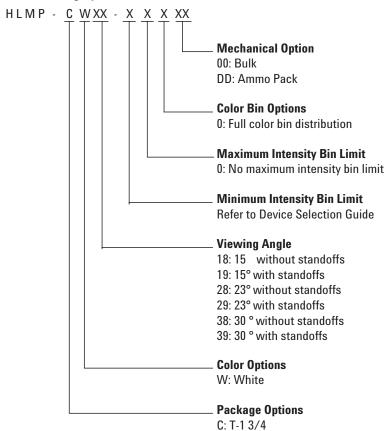
### **Device Selection Guide**

Part Number	Typ. Viewing Angle	Iv (cd) @ 20mA		Standoff Leads	Package
		Min.	Тур.	Standon Leads	Dimension
HLMP-CW18-VY0xx	15°	4.20	6.40	No	А
HLMP-CW19-VY0xx	15°	4.20	6.40	Yes	В
HLMP-CW28-TW0xx	23°	2.50	3.80	No	А
HLMP-CW29-TW0xx	23°	2.50	3.80	Yes	В
HLMP-CW38-SV0xx	30°	1.90	3.00	No	Α
HLMP-CW39-SV0xx	30°	1.90	3.00	Yes	В

### 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. LED light output is bright enough to cause injuries to the eyes. Precautions must be taken to prevent looking directly at the LED with unprotected eyes.

### **Part Numbering System**



# Absolute Maximum Ratings ( $T_A = 25^{\circ}C$ )

Parameter	Value	Units
DC Forward Current <sup>[1]</sup>	30	mA
Peak Forward Current [2]	100	mA
Average Forward Current	30	mA
Power Dissipation	120	mW
LED Junction Temperature	130	°C
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-40 to +100	°C
Dip-Drag Solder Temperature [3]	260 for 5 secs	°C
Wave Solder Temperature [3]	245 for 3 secs	°C

### Notes:

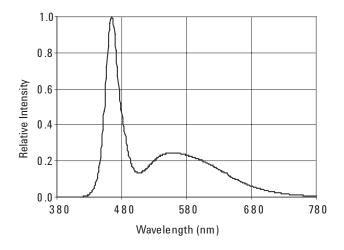
- 1. Derate linearly as shown in Figure 4.
- 2. Duty Factor 30%, 1 KHz
- 3. 1.59 mm (0.060 inch) below seating plane

# Electrical/Optical Characteristics ( $T_A = 25^{\circ}C$ )

Parameters	Symbol	Minimum	Typical	Maximum	Units	Test Condition
Forward voltage	V <sub>F</sub>		3.4	4.0	V	I <sub>F</sub> = 20 mA
Capacitance	С		53		pF	V <sub>F</sub> =0, f=1 MHz
Reverse Voltage [1]	V <sub>R</sub>		0.6		V	I <sub>R</sub> = 10 mA
Thermal resistance	Rq <sub>J-PIN</sub>		240		°C/W	LED Junction to cathode lead
Viewing Angle <sup>[2]</sup> CW18/CW19 CW28/CW29 CW38/CW39	2q <sub>1/2</sub>		15 23 30		Degree	I <sub>F</sub> = 20 mA
Chromaticity Coordinate [3]	X Y		0.31 0.32			I <sub>F</sub> = 20 mA

### Notes:

- 1. The reverse voltage of the product is equivalent to the forward voltage of the protective chip at  $I_R = 10 \text{ m}$
- 2.  $2q_{1/2}$  is the off-axis angle where the luminous intensity is ½ the on axis intensity
- 3. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent the perceived color of the device.
- 4. The radiant intensity, le in watts/steradian, may be found from the equation le =  $lv/h_{\nu}$ , where lv is the luminous intensity in candelas and  $h_{\nu}$  is the luminous efficacy in lumens/watt.



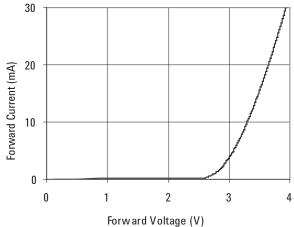
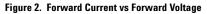
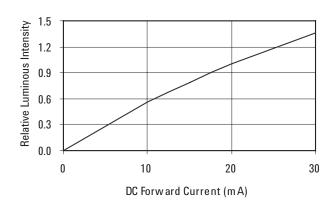


Figure 1. Relative Intensity vs Wavelength





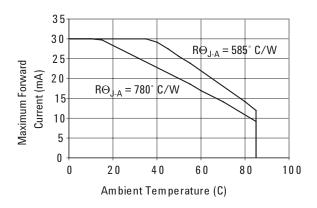


Figure 3. Relative Iv vs. Forward Current

Figure 4. Maximum Fwd Current vs Temperature

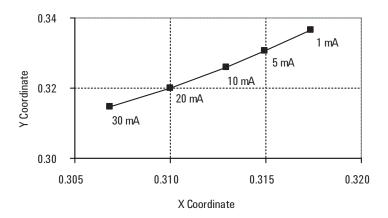
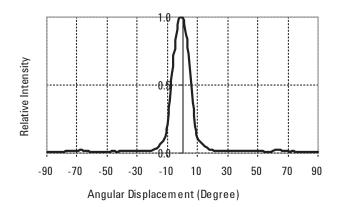


Figure 5. Chromaticity Coordinates Changes over Forward Current



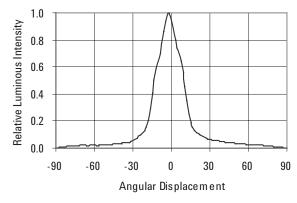


Figure 6a. CW1x Spatial Radiation Pattern

Figure 6b. CW2x Spatial Radiation Pattern

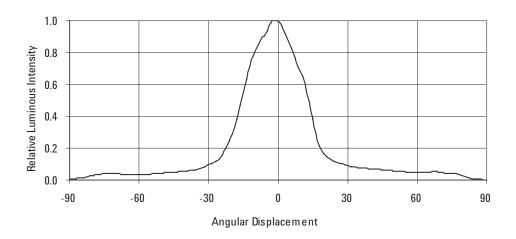


Figure 6c. CW3x Spatial Radiation Pattern

# **Intensity Bin Limit Table**

Bin	Intensity (mcd) at 20 mA				
	Min	Max			
S	1900	2500			
T	2500	3200			
U	3200	4200			
V	4200	5500			
W	5500	7200			
Χ	7200	9300			
Υ	9300	12000			

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

### **Color Bin Limit Tables**

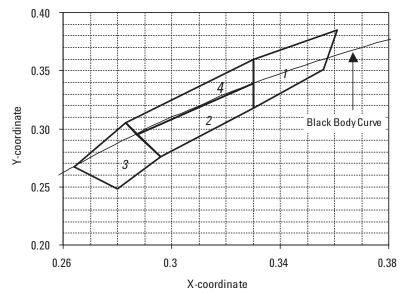
Rank	Limits (Chromaticity Coordinates)						
1	x	0.330	0.330	0.356	0.361		
	y	0.360	0.318	0.351	0.385		
2	x	0.287	0.296	0.330	0.330		
	y	0. 295	0.276	0.318	0.339		
3	x	0.264	0.280	0.296	0.283		
	y	0.267	0.248	0.276	0.305		
4	x	0.283	0.287	0.330	0.330		
	y	0.305	0.295	0.339	0.360		

Tolerance for each bin limit is  $\pm 0.01$ 

### 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

# **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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