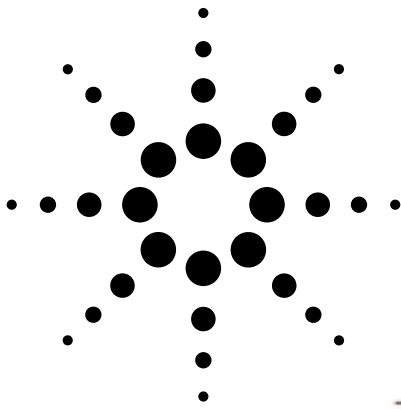


# Agilent Radiometrically Tested AlInGaP II LED Lamps for Sensor-Based Applications Data Sheet



## SunPower Series Precision Optical Performance HLMP-ED80-xxxxx

### Description

Radiometrically Tested Precision Optical Performance AlInGaP II (aluminum indium gallium phosphide) LEDs offer increased sensor-based application design flexibility. High-resolution radiometric intensity bins (mW/sr) enable customers to precisely match LED lamp performance with sensor functionality.

Visible LEDs offer new styling alternatives – light can be leveraged to develop more attractive products. In comparison to invisible infrared sources, safety concerns are significantly improved by the human autonomic pupil response and reflexive movement away from bright light. Visible LEDs further indicate system on / off status.

The AlInGaP II technology provides extremely stable light output over very long periods of time, with low power consumption.

These lamps are made with an advanced optical grade epoxy system offering superior high temperature and moisture resistance performance in outdoor systems. The epoxy contains both uv-a and uv-b inhibitors to reduce the effects of long term exposure to direct sunlight.

Please contact your Agilent Technologies Representative for more information and design for manufacture advice. Application Brief I-024 *Pulsed Operating Ranges for AlInGaP LEDs vs. Projected Long Term Light Output Performance* and other application information is available at:  
[www.agilent.com/go/led\\_lamps](http://www.agilent.com/go/led_lamps).

### Features

- Characterized by radiometric intensity
- High optical power output
- Extremely long useful life
- Low power consumption
- Well defined spatial radiation patterns
- 639 nm<sub>PEAK</sub> red color
- 30° viewing angle
- High operating temperature: T<sub>JLED</sub> = +130°C
- Superior resistance to moisture
- Suitable for outdoor use

### Benefits

- Radiometric LED characterization decreases system variability
- Improved system reliability
- Visual styling
- Visible color for improved application safety
- On/off indication
- Suitable for a variety of sensor-based applications

### Applications

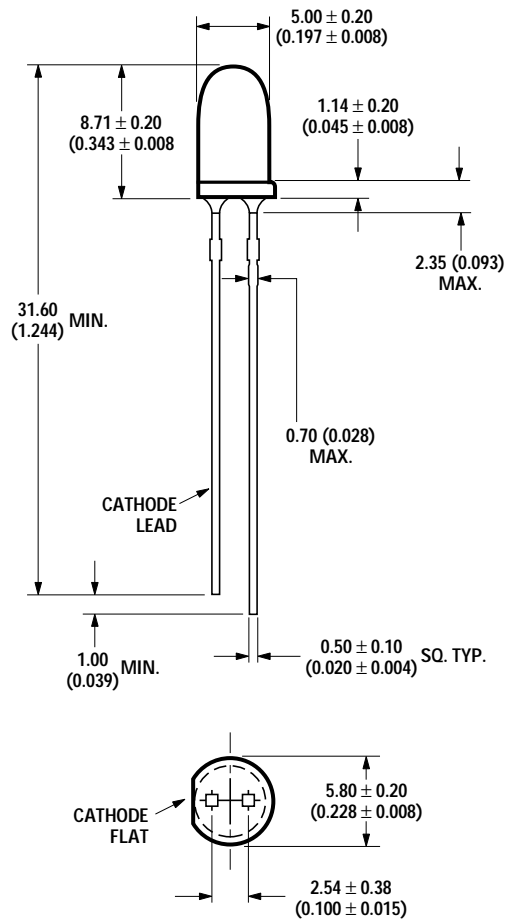
- Photo sensor stimulus
- Infrared emitter replacement
- Solid state optical mouse sensors
- Surface imaging sensors
- Optical position and motion sensors
- Human interface devices
- Computer printer dot quality control
- Battery powered systems



## Device Selection Guide

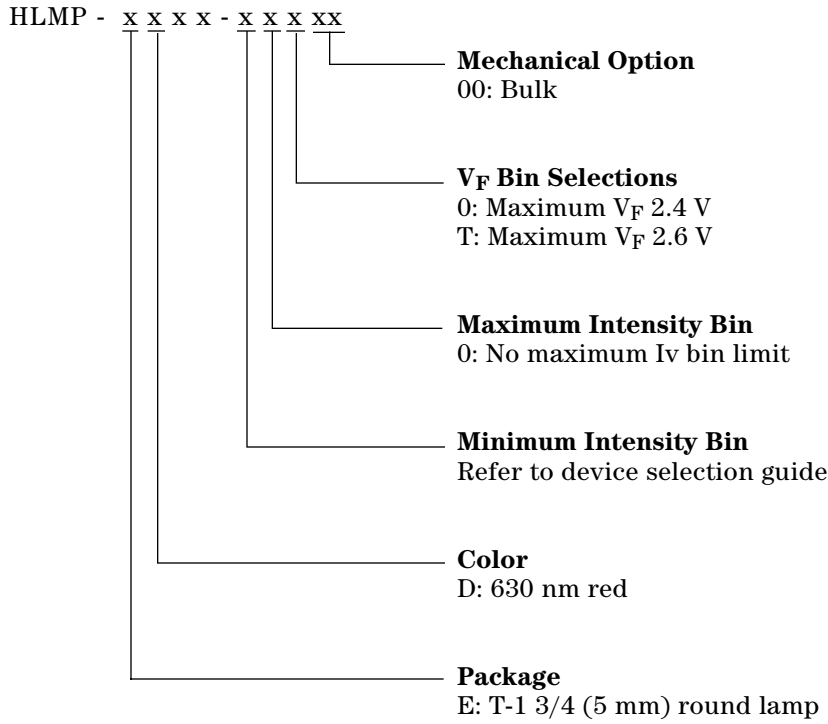
Part Number	Minimum Radiometric Intensity (mW/Sr) at 20 mA	Maximum Forward Voltage (V) at 20 mA
HLMP-ED80-K0T00	7.2	2.6
HLMP-ED80-K0000	7.2	2.4

## Package Dimensions



NOTE:  
ALL DIMENSIONS ARE IN mm (INCHES).

## Part Numbering System



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

DC Forward Current <sup>[1,2,3]</sup> .....	50 mA
Peak Pulsed Forward Current <sup>[2,3]</sup> .....	100 mA
Average Forward Current .....	30 mA
Reverse Voltage (I <sub>R</sub> = 100 μA) .....	5 V
LED Junction Temperature .....	130°C
Operating Temperature .....	-40°C to +100°C
Storage Temperature .....	-40°C to +120°C
Wave Solder Temperature .....	250°C for 3 seconds
Solder Dipping Temperature .....	260°C for 5 seconds
	[ 1.59 mm (0.060 in.) below body]

### Notes:

1. Derate linearly as shown in Figure 4.
2. For long term performance with minimal light output degradation, drive currents between 10 mA and 30 mA are recommended. For more information on recommended drive conditions, please refer to HP Application Brief I-024 (5966-3087E).
3. Please contact your Agilent sales representative about operating currents below 10 mA.

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

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage						
ED80-xx0xx	$V_F$		2.00	2.40	V	$I_F = 20\text{ mA}$
ED80-xxTxx			2.35	2.60		
Reverse Voltage	$V_R$	5	20		V	$I_R = 100\ \mu\text{A}$
Peak Wavelength	$\lambda_{\text{PEAK}}$		639		nm	Peak of Wavelength of Spectral Distribution at $I_F = 20\text{ mA}$
Dominant Wavelength <sup>[1]</sup>	$\lambda_d$		630		nm	
Spectral Halfwidth	$\Delta\lambda_{1/2}$		17		nm	Wavelength Width at Spectral Distribution $1/2$ Power Point at $I_F = 20\text{ mA}$
Speed of Response	$\tau_s$		20		ns	Exponential Time Constant, $e^{-t/\tau_s}$
Capacitance	C		40		pF	$V_F = 0, f = 1\text{ MHz}$
Thermal Resistance	$R\theta_{J-PIN}$		240		$^\circ\text{C}/\text{W}$	LED Junction-to-Cathode Lead
Luminous Efficacy <sup>[5]</sup>	$\eta_v$		155		lm/W	Emitted Luminous Power/Emitted Radiant Power at $I_F = 20\text{ mA}$
Viewing Angle <sup>[2]</sup>	$2\ \theta_{1/2}$		30		Deg.	
Radiometric Intensity	$I_e$	7.23		50.50	mW/sr	Emitted Radiant Power at $I_F = 20\text{ mA}$

### Notes:

1. Dominant wavelength,  $\lambda_d$ , is derived from the CIE Chromaticity Diagram referenced to Illuminant E.
2.  $\theta_{1/2}$  is the off-axis angle where the luminous intensity is one half the on-axis intensity.
3. The radiometric 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 luminous intensity,  $I_v$ , in candelas, may be found from the equation  $I_v = I_e \eta_v$ , where  $I_e$  is the radiometric intensity in watts per steradian and  $\eta_v$  is the luminous efficacy in lumens/watt.
6. For option -xxTxx, max. forward voltage ( $V_f$ ) is 2.6 V. Refer to  $V_f$  bin table.

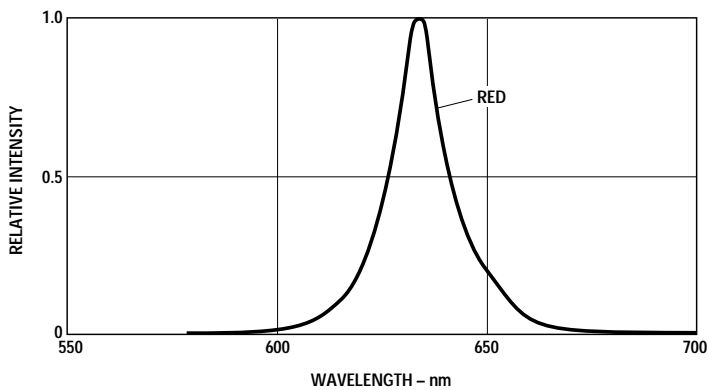


Figure 1. Relative Intensity vs. Peak Wavelength.

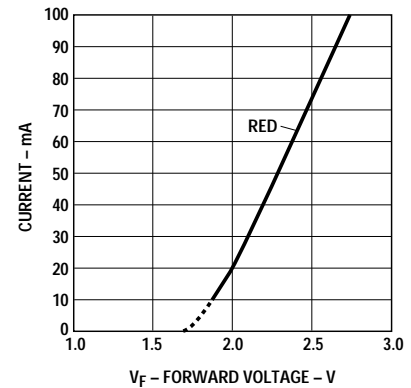


Figure 2a. Forward Current vs. Forward Voltage for Option -xx0xx.

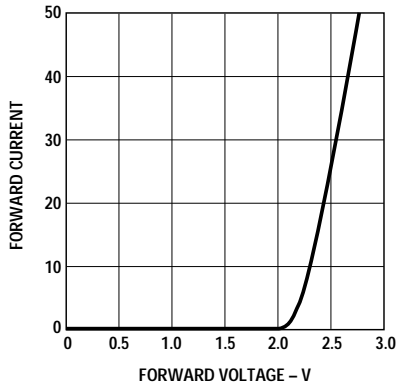


Figure 2b. Forward Current vs. Forward Voltage for Option -xxTxx.

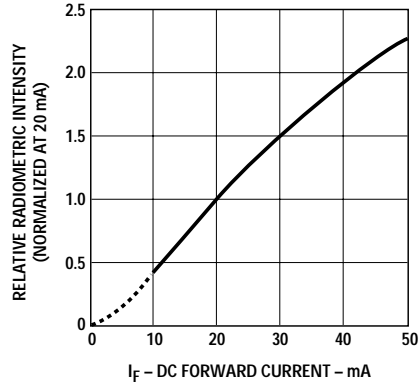


Figure 3. Relative Luminous Intensity vs. Forward Current.

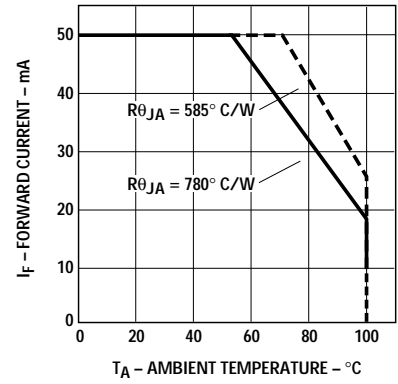


Figure 4. Maximum Forward Current vs. Ambient Temperature. Derating Based on  $T_{JMAX} = 130^{\circ}C$ .

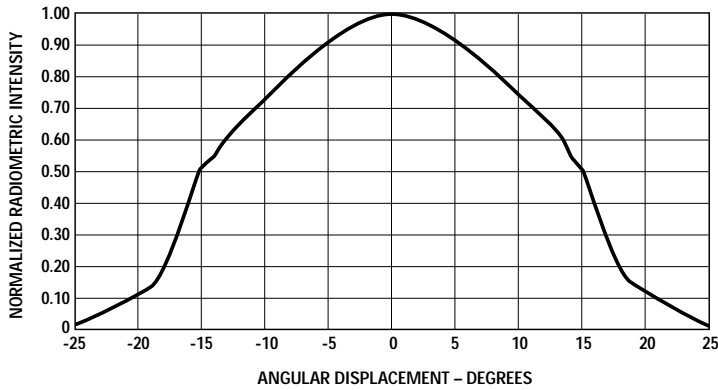


Figure 5. Representative Spatial Radiation Pattern for 30° Viewing Angle Lamps.

### Radiometric Intensity Bin Limits (mW/sr at 20 mA)

Bin ID	Min.	Max.
K	8.5	10.2
L	10.2	12.2
M	12.2	14.7
N	14.7	17.6
P	17.6	21.2
Q	21.2	25.4
R	25.4	30.5
S	30.5	36.5
T	36.5	43.9

### Vf Bin Table<sup>[3]</sup>

Bin ID	Min.	Max.
VA	2.0	2.2
VB	2.2	2.4
VC	2.4	2.6

Tolerance for each bin limit is  $\pm 0.05$  V.

### Notes:

1. Tolerance for each bin will be  $\pm 15\%$ .
2. Bin categories are established for classification of products. Products may not be available in all bin categories.
3. Vf bin table only available for those number with options -xxTxx.

**[www.agilent.com/semiconductors](http://www.agilent.com/semiconductors)**

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

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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.

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