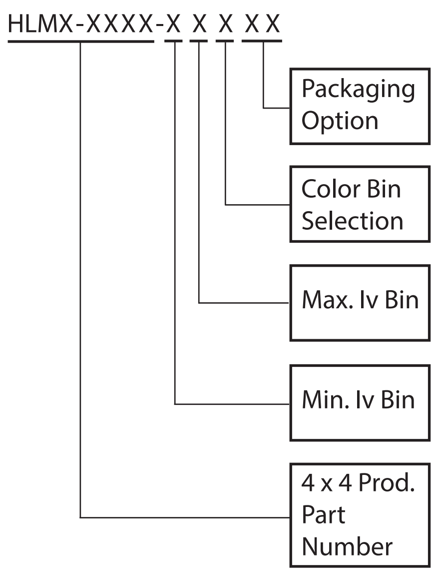
Device Selection Guide

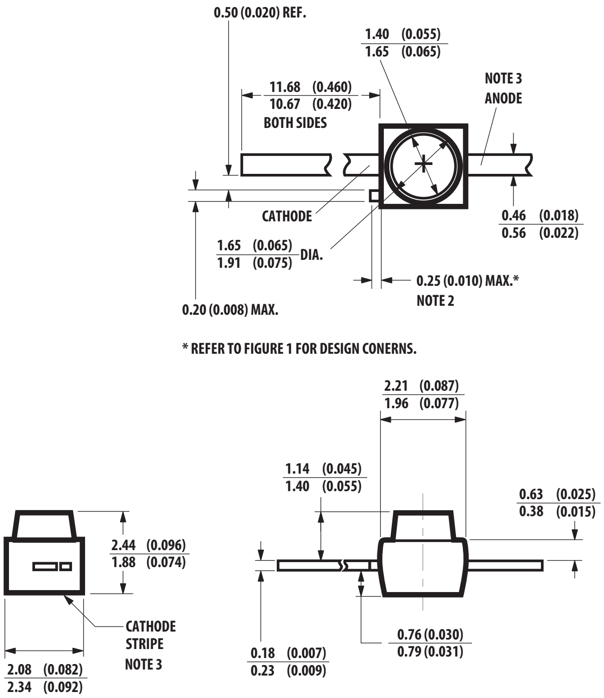
Package Description	Viewing Angle $2\theta_{1/2}$	Deep Red Rd = 630 nm	Typical Iv I_F = 500 µA	Typical Iv I_F = 20 mA	Package Outline
Domed, Diffused Tinted, Standard Current	35	HLMP-Q102	—	—	B
Domed, Diffused Tinted, Low Current	35	HLMP-Q152	2	—	B
Domed, Nondiffused Untinted, Standard Current	15	HLMP-Q106	—	—	B
Domed, Nondiffused Untinted, Low Current	15	HLMP-Q156	7	—	B
Flat Top, Nondiffused Untinted Standard Current	75	HLMP-P106	—	—	A
Flat Top, Nondiffused Untinted, Low Current	75	HLMP-P156	2	—	A

Ordering Information

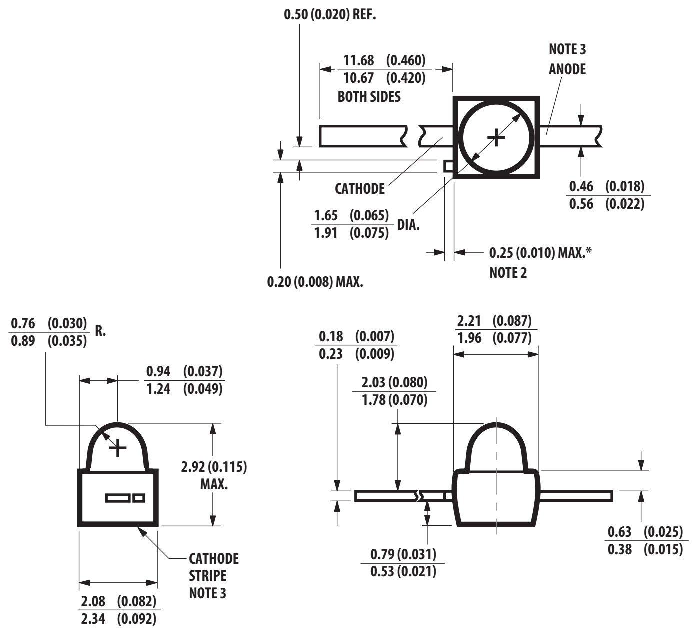


Package Dimensions

A) Flat-Top Lamps

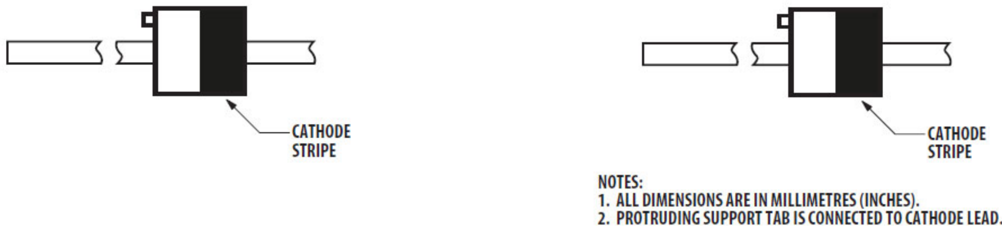


B) Diffused and Nondiffused Dome Lamps

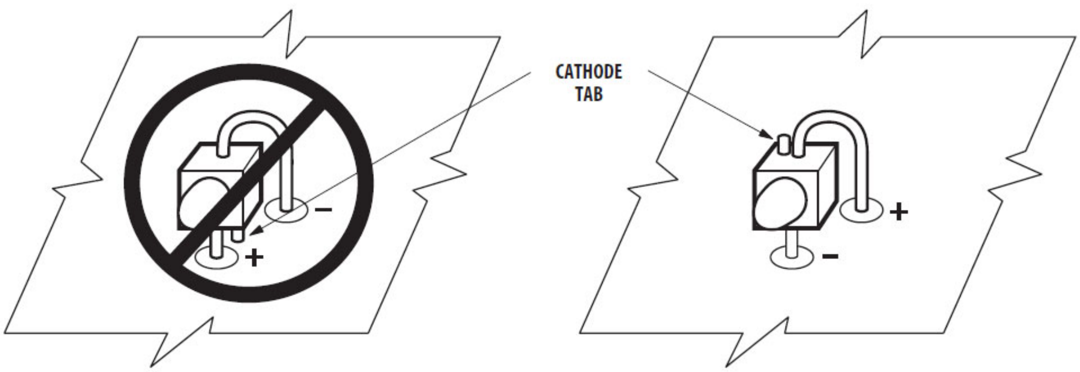


NOTE: All dimensions are in millimeters (inches).

Figure 1: Proper Right-Angle Mounting to a PC Board to Prevent Protruding Cathode Tab from Shorting to Anode Connection



Package Mounting



Proper right angle mounting to a PC board to prevent protruding cathode tab from shorting to anode connection.

Absolute Maximum Ratings at T_A = 25°C

Parameters	Value
DC Forward Current[a]	50 mA
Peak Forward Current[b]	300 mA
Average Forward Current[b, c]	30 mA
Transient Forward Current (10 ms Pulse)[d]	500 mA
Power Dissipation	100 mW[e]
Reverse Voltage	5V
Junction Temperature	110°C
Operating Temperature	–55°C to +100°C
Storage Temperature	–55°C to +100°C
Lead Soldering Temperature (1.6 mm [0.063 in.] from body)	260°C for 5 seconds
Reflow Soldering Temperature	260°C for 20 seconds

a. Derate linearly as shown in Figure 6.

b. See Figure 7 to establish pulsed operating conditions.

c. Maximum IAVG at f = 1 kHz, DF = 10%.

d. The transient peak current is the maximum non-recurring peak current the device can withstand without damaging the LED die and wire bonds. It is not recommended that the device be operated at peak currents above the Absolute Maximum Peak Forward Current.

e. 120 mW for HLMP-P156-HK0xx and HLMP-Q106-VX0xx.

Optical Characteristics at T_A = 25°C

Part Number	Luminous Intensity I_V (mcd) at 20 mA[a]		Total Flux Peak ϕ_V (mln) at 20 mA[b]	Peak Wavelength λ_{peak} (nm)	Color, Dominant Wavelength λ_d[c] (nm)	Viewing Angle 2θ½ Degrees[d]	Luminous Efficacy η_v[e](lm/w)
	Min.	Typ.	Typ.	Typ.	Typ.	Typ.	
HLMP-Q106-R00xx	100	400	280	640	630	15	85
HLMP-Q102-N00xx	25	100	—	640	630	35	85
HLMP-Q106-VX0xx	630	—	—	640	630	15	—
HLMP-P106-Q00xx	63	130	280	640	630	75	85

a. The luminous intensity, Iv, is measured at the mechanical axis of the lamp package. The actual peak of the spatial radiation pattern may not be aligned with this axis.

b. ϕ_V is the total luminous flux output as measured with an integrating sphere.

c. The dominant wavelength, λ_d, is derived from the CIE Chromaticity Diagram and represents the color of the device.

d. θ1/2 is the off-axis angle where the liminous intensity is 1/2 the peak intensity.

e. Radiant intensity, I_v, in watts/steradian, may be calculated from the equation $I_v = I_V/\eta_V$, where I_v is the luminous intensity in candelas and η_V is the luminous efficacy in lumens/watt.

Optical Characteristics at T_A = 25°C

Part Number (Low Current)	Luminous Intensity I_V (mcd) at 0.5 mA[a]		Total Flux Peak ϕ_V (mln) at 0.5 mA[b]	Peak Wavelength λ_{peak} (nm)	Color, Dominant Wavelength λ_d[c] (nm)	Viewing Angle 2θ½ Degrees[d]	Luminous Efficacy η_v[e](lm/w)
	Min.	Typ.	Typ.	Typ.	Typ.	Typ.	
HLMP-Q156-H00xx	2.5	7	10.5	640	630	15	85
HLMP-Q152-G00xx	1.6	2	—	640	630	35	85
HLMP-P156-EG0xx	0.63	2	10.5	640	630	75	85
HLMP-P156-HK0xx	2.5	—	—	640	630	75	—

a. The luminous intensity, Iv, is measured at the mechanical axis of the lamp package. The actual peak of the spatial radiation pattern may not be aligned with this axis.

b. ϕ_V is the total luminous flux output as measured with an integrating sphere.

c. The dominant wavelength, λ_d, is derived from the CIE Chromaticity Diagram and represents the color of the device.

d. $\theta^1/_2$ is the off-axis angle where the liminous intensity is $^1/_2$ the peak intensity.

e. Radiant intensity, I_v, in watts/steradian, may be calculated from the equation $I_v = I_V/\eta_V$, where I_v is the luminous intensity in candelas and η_V is the luminous efficacy in lumens/watt.

Electrical Characteristics at T_A = 25°C

Part Number	Forward Voltage V_F (Volts) at I_F = 20 mA		Reverse Breakdown V_R (Volts) at I_R = 100 µA		Capacitance C (pF) V_F = 0, f = 1 MHz	Thermal Resistance $R\theta_{J-PIN}$ (°C/W)	Speed of Response τ_s (ns) Time Constant $e^{-t/\tau s}$
	Typ.	Max.	Min.	Typ.	Typ.		Typ.
HLMP-Q106	2.0	2.4	5	25	20	170	45
HLMP-Q106-VX0xx	2.0	2.6	5	25	—	170	—
HLMP-Q102	2.0	2.4	5	25	20	170	45
HLMP-P106	2.0	2.4	5	25	20	170	45

Electrical Characteristics at T_A = 25°C

Part Number (Low Current)	Forward Voltage V_F (Volts) at I_F = 0.5 mA		Reverse Breakdown V_R (Volts) at I_R = 100 µA		Capacitance C (pF) V_F = 0, f = 1 MHz	Thermal Resistance $R\theta_{J-PIN}$ (°C/W)	Speed of Response τ_s (ns) Time Constant $e^{-t/\tau s}$
	Typ.	Max.	Min.	Typ.	Typ.		Typ.
HLMP-Q156	1.7	1.9	5	25	20	170	45
HLMP-Q152	1.7	1.9	5	25	20	170	45
HLMP-P156	1.7	1.9	5	25	20	170	45
HLMP-P156-HK0xx	1.7	1.9	5	25	—	170	—

Figure 2: Relative Intensity vs. Wavelength

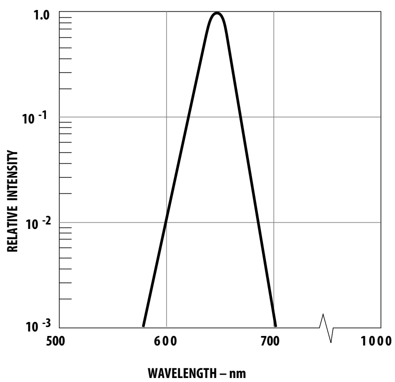


Figure 3: Forward Current vs. Forward Voltage

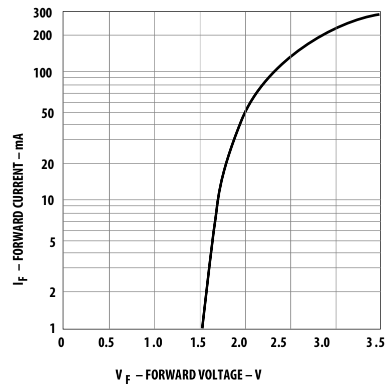


Figure 4: Relative Luminous Intensity vs. DC Forward Current

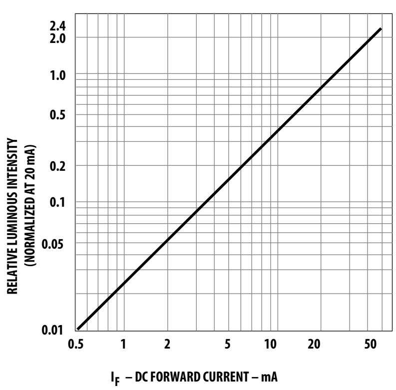


Figure 5: Relative Efficiency vs. Peak Forward Current

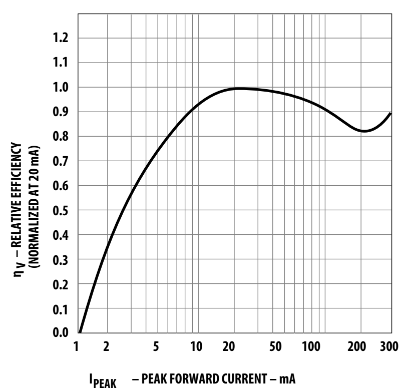


Figure 6: Maximum Forward DC Current vs. Ambient Temperature. Derating based on T_JMAX = 110°C.

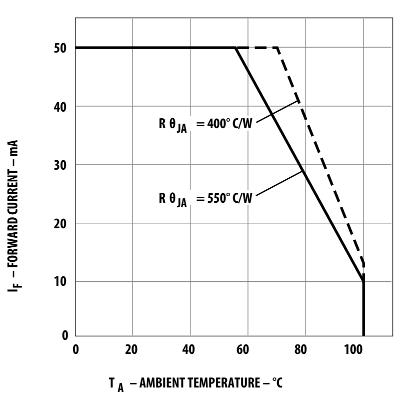


Figure 7: Maximum Average Current vs. Peak Forward Current

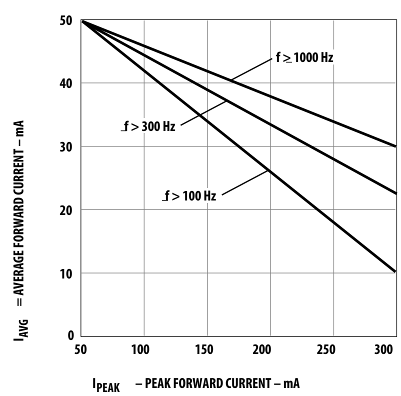


Figure 8: HLMP-Q106/-Q156

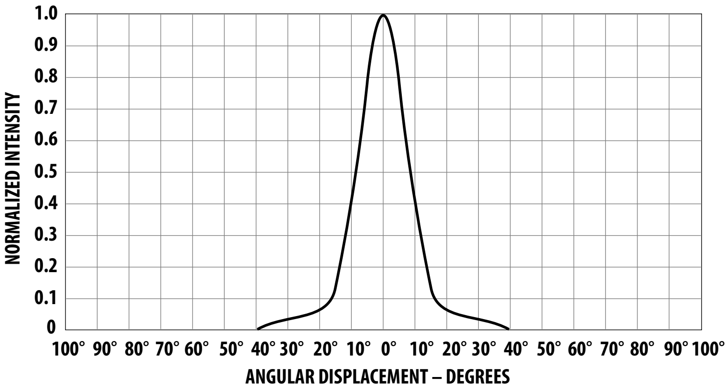


Figure 9: HLMP-Q102/-Q152

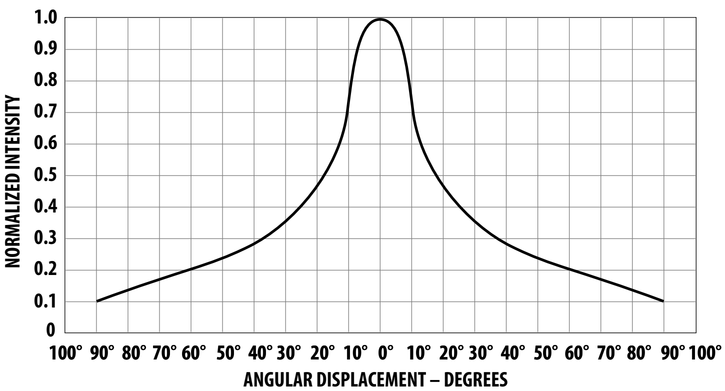
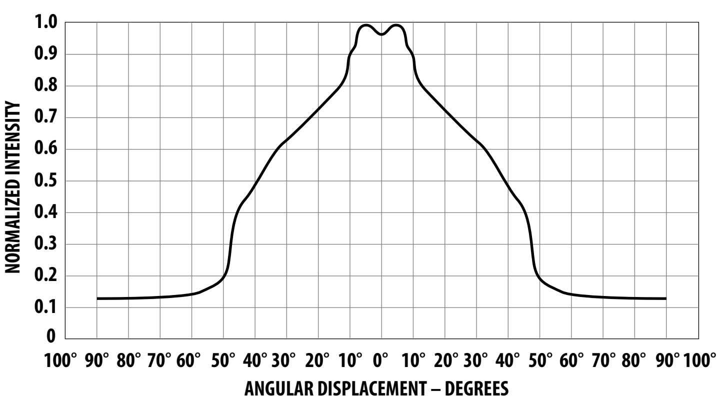


Figure 10: HLMP-P106/-P156



Intensity Bin Limits

Bin	Min.	Max.
E	0.63	1.25
F	1.00	2.00
G	1.60	3.20
H	2.50	5.00
J	4.00	8.00
K	6.30	12.50
L	10.00	20.00
M	16.00	32.00
N	25.00	50.00
P	40.00	80.00
Q	63.00	125.00
R	100.00	200.00
S	160.00	320.00
T	250.00	500.00
U	400.00	800.00
V	630.00	1250.00
W	1000.00	2000.00
X	1600.00	3200.00
Y	2500.00	5000.00

Color Bin Limits

Package	Bin	Min.	Max.
Red	0	Full Distribution	

Mechanical Option

00	Straight Leads, Bulk Packaging, Quantity of 500 Parts
11	Gull Wing Leads, 12-mm Tape on 7-in. Diameter Reel, 1500 Parts per Reel
12	Gull Wing Lead, Bulk Packaging, Quantity of 500 Parts
14	Gull Wing Leads, 12-mm Tape on 13-in. Dia. Reel, 6000 Parts per Reel
21	Yoke Leads, 12-mm Tape on 7-in. Dia. Reel, 1500 Parts per Reel
22	Yoke Leads, Bulk Packaging, Quantity of 500 Parts
24	Yoke Leads, 12-mm Tape on 13-in. Dia. Reel, 6000 Parts per Reel
31	Z-Bend Leads, 12-mm Tape on 7-in. Dia. Reel, 1500 Parts per Reel
32	Z-Bend Leads, Bulk Packaging, Quantity of 500 Parts
34	Z-Bend Leads, 12-mm Tape on 13-in. Dia. Reel, 6000 Parts per Reel

NOTE: All categories are established for classification of products. Products may not be available in all categories. Contact your local Broadcom representative for further clarification and information.

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