LUMILEDS™

Technical Data
Super Flux LEDs

HPWA-MH00	HPWT-MH00
HPWA-DH00	HPWT-DH00
HPWT-RD00	HPWT-BH00
HPWT-MD00	HPWT-RL00
HPWT-DD00	HPWT-ML00
HPWT-BD00	HPWT-DL00
HPWT-RH00	HPWT-BL00

Features

- High flux output
- Designed for high current operation
- Low thermal resistance
- Low profile
- Meets SAE/ECE/JIS automotive color requirements
- Packaged in tubes for use with automatic insertion equipment

Benefits

- Fewer LEDs required
- Lowers lighting system cost

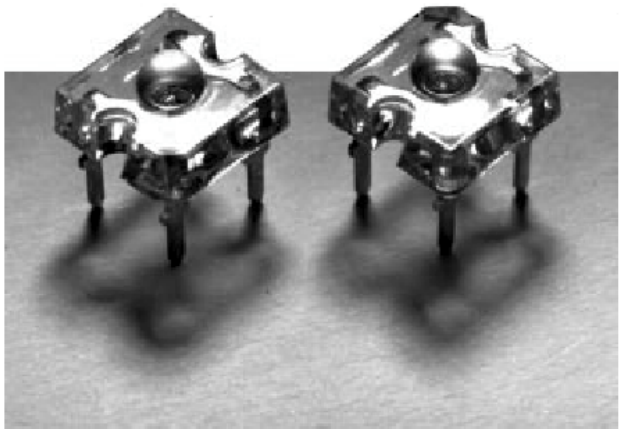
Applications

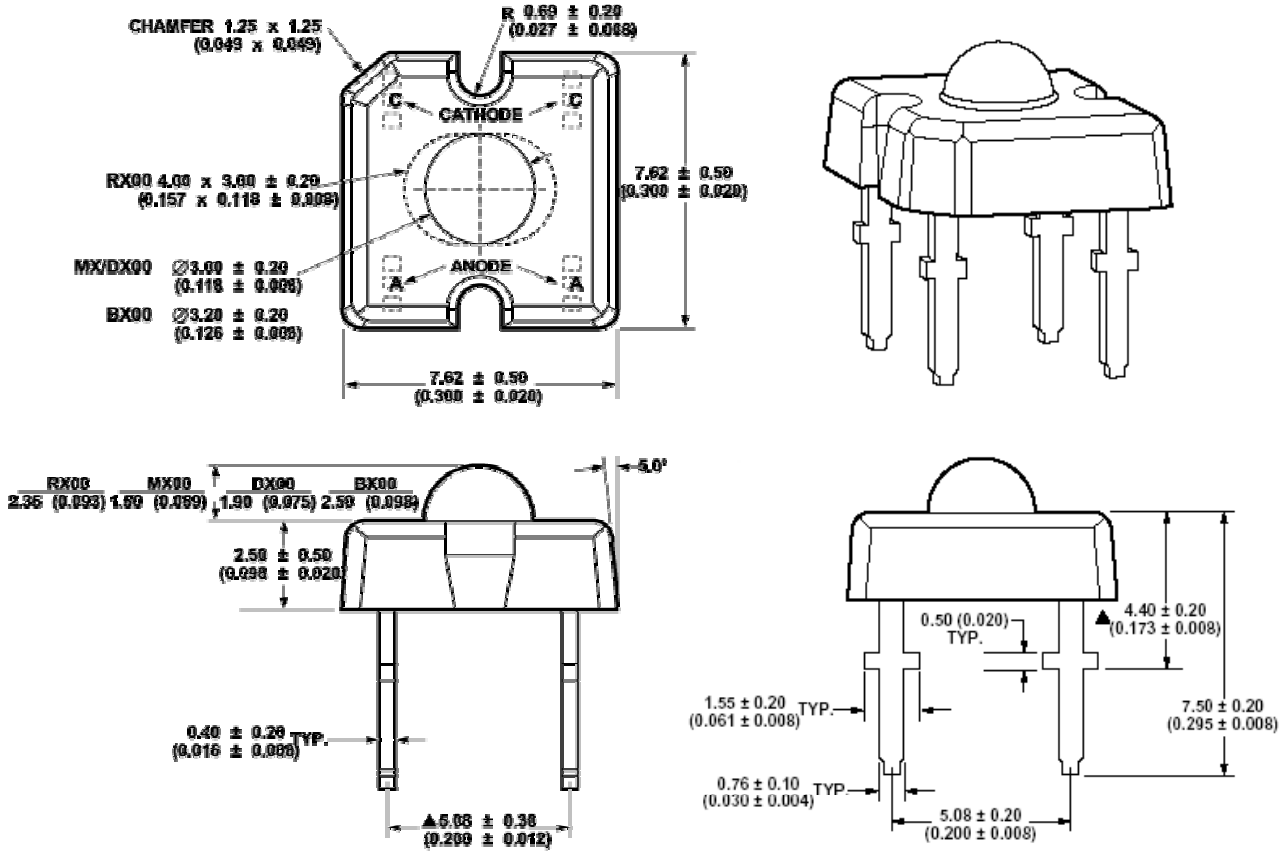
- Automotive exterior lighting
- Electronic signs and signals

This revolutionary package design allows the lighting designer to reduce the number of LEDs required and provide a more uniform and unique illuminated appearance than with other LED solutions. This is possible through the efficient optical package design and high-current capabilities.

The low profile package can be easily coupled with reflectors or lenses to efficiently distribute light and provide the desired lit appearance.

This product family employs the world's brightest red-orange and amber LED materials, which allow designers to match the color of popular lighting applications, such as automotive tail, stop and turn signal lamps, and electronic signs.





NOTES:
1. DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. DIMENSIONS WITHOUT TOLERANCES ARE NOMINAL.
3. CATHODE LEADS ARE INDICATED WITH A "C" AND ANODE LEADS ARE INDICATED WITH AN "A".
4. ▲ DENOTES SPECIAL CHARACTERISTIC.

Device Selection Guide

Part Number	LED Color	Total Flux θ_V (mlm) @ 70 mA[1] Typ.	Total Included Angle θ_{90V} (Degrees)[2] Typ.
HPWA-MH00-00000	AS AlInGaP Red-Orange	1500	95
HPWA-DH00-00000			75
HPWT-RD00-00000	TS AlInGaP Red	3000	44 x 88
HPWT-MD00-00000			100
HPWT-DD00-00000			70
HPWT-BD00-00000			50
HPWT-RH00-0000	TS AlInGaP Red-Orange	3750	44 x 88
HPWT-MH00-0000			100
HPWT-DH00-0000			70
HPWT-BH00-0000			50
HPWT-RL00-00000	TS AlInGaP Amber	1500	44 x 88
HPWT-ML00-00000			100
HPWT-DL00-00000			70
HPWT-BL00-00000			50

Notes:
1. θ_V is the total luminous flux output as measured with an integrating sphere after the device has stabilized ($R\theta_{j-a}$ = 200° C/W, T_A = 25°C).
2. $\theta_{0.90V}$ is the included angle at which 90% of the total luminous flux is captured.

Absolute Maximum Ratings at TA = 25º

Parameter	HPWA-XX00	HPWT-XX00	Units
DC Forward Current [1, 2]	70	70	mA
Power Dissipation	187	221	mW
Reverse Voltage (I_R = 100 µA)	10	10	V
Operating Temperature Range	-40 to +100	-40 to +100	°C
Storage Temperature	-55 to +100	-55 to +100	°C
High Temperature Chamber		125°C, 2 Hours	
LED Junction Temperature		125°C	
Solder Conditions			
Preheat Temperature		100°C for 30 seconds	
Solder Temperature		260°C for 5 seconds [1.5 mm (0.06 in.) below seating plane	

Notes:
1. Derate linearly as shown in Figures 4a and 4b.
2. Operation at currents below 10 mA is not recommended, please contact your sales representative or Future Electronics.

Optical Characteristics at T_A = 25°C, I_F = 70 mA, $R_{\theta J-A}$ = 200°C C/W

Device Type	Total Flux θ(mlm)[1] Min.	Total Flux θ(mlm)[1] Typ.	Peak Wavelength λ peak (nm) Typ.	Color, Dominant Wavelength λ peak (nm)[2] Typ.	Total Included Angle $\theta_{0.90V}$ (Degrees) [3] Typ.	Luminous Intensity/ Total Flux I_V (mcd)/Φ_V (mlm) Typ.	Viewing Angle 2θ 1/2 (Degrees) Typ.
HPWA-MH00	600	1500	624	618	95	0.6	90
HPWA-DH00					75	0.9	60
HPWT-RD00	1000	3000	640	630	44 x 88	1.25	25 x 68
HPWT-MD00					100	0.6	70
HPWT-DD00					70	1.5	40
HPWT-BD00					50	2.0	30
HPWT-RH00	1000	3750	626	620	44 x 88	1.25	25 x 68
HPWT-MH00					100	0.6	70
HPWT-DH00					70	1.5	40
HPWT-BH00					50	2.0	30
HPWT-RL00	1000	1500	596	594	44 x 88	1.25	25 x 68
HPWT-ML00					100	0.6	70
HPWT-DL00					70	1.5	40
HPWT-BL00					50	2.0	30

Notes:
1. Φ_V is the total luminous flux output as measured with an integrating sphere after the device has stabilized.
2. The dominant wavelength is derived from the CIE Chromaticity Diagram and represents the perceived color of the device.
3. $\theta_{0.90V}$ is the included angle at which 90% of the total luminous flux is captured.

Electrical Characteristics at T_A = 25°C

Device Type	Forward Voltage V_F(Volts) @ I_F = 70 mA Min.	Typ.	Max.	Reverse Breakdown V_R (Volts) @ I_R = 100 μA Min.	Typ.	Capacitance C (pF) VF = 0, f = 1MHz Typ.	Thermal Resistance Rθ_{J-PIN} (°C/W) Typ.	Speed of Response τ_s (ns)[1] Typ.
HPWA-XH00	1.83	2.1	2.67	10	20	40	155	20
HPWT-XD00	2.15	2.5	3.03	10	20	40	155	20
HPWT-XH00	2.15	2.5	3.03	10	20	40	155	20
HPWT-XL00	2.15	2.6	3.15	10	20	40	155	20

Note:
τ_s is the time constant, e^{-t/τ_s}.

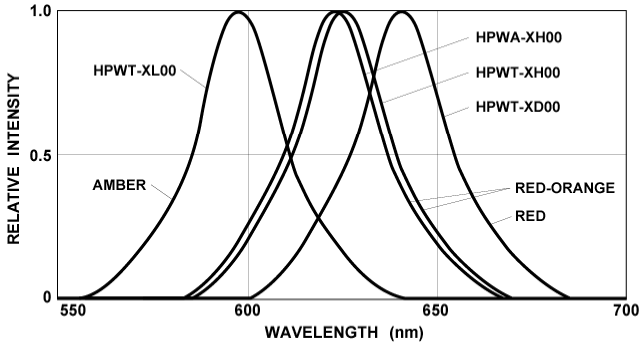


Figure 1. Relative Intensity vs. Wavelength

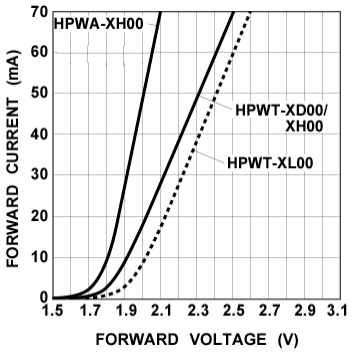


Figure 2. Forward Current vs. Forward Voltage.

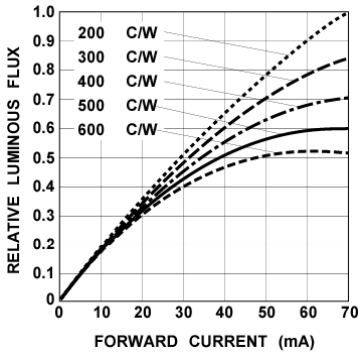


Figure 3. HPWA/HPWT-XX00 Relative Luminous Flux vs. Forward Current.

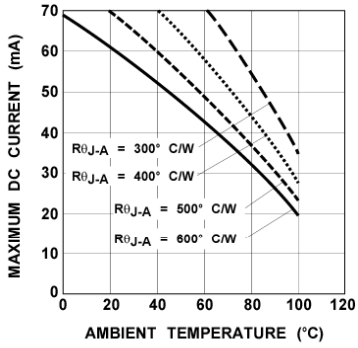


Figure 4a. HPWA-XX00 Maximum DC Forward Current vs. Ambient Temperature.

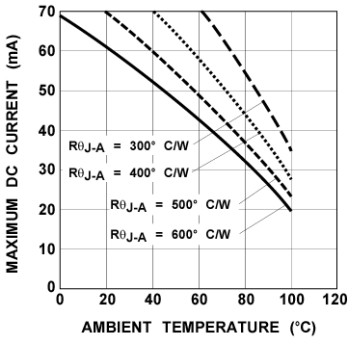


Figure 4b. HPWT-XX00 Maximum DC Forward Current vs. Ambient Temperature.

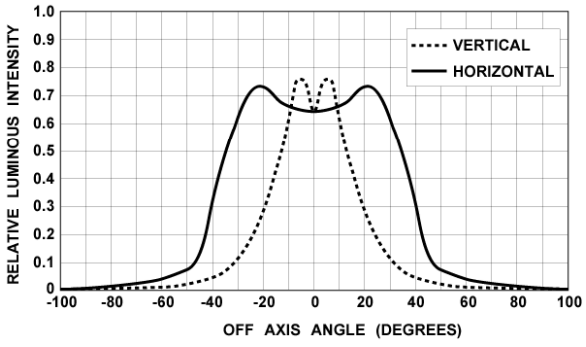


Figure 5a. HPWT-RX00 Relative Luminous Intensity vs. Off Axis Angle.

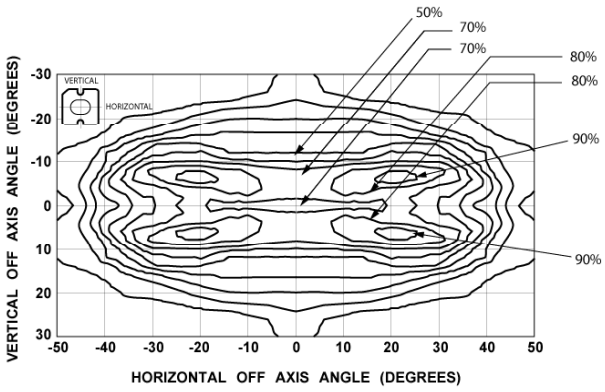


Figure 5b. HPWT-RX00 Relative Luminous Intensity vs. Off Axis Angle. Iso-Intensity Contour Plot.

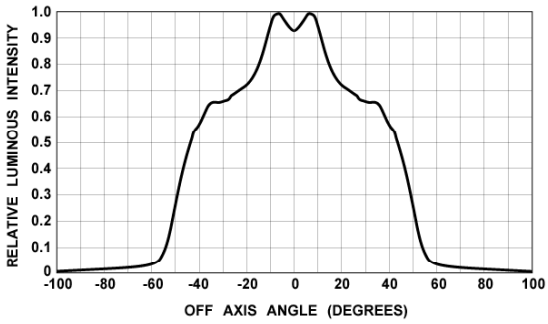


Figure 5c. HPWA-MX00 Relative Luminous Intensity vs. Off Axis Angle.

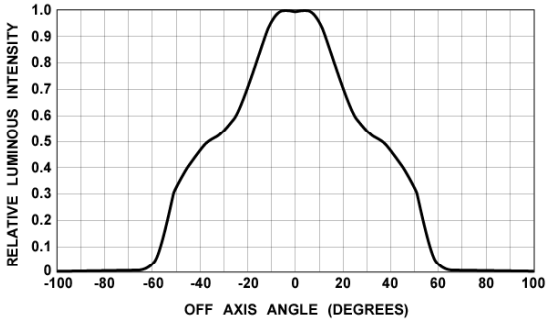


Figure 5d. HPWT-MX00 Relative Luminous Intensity vs. Off Axis Angle.

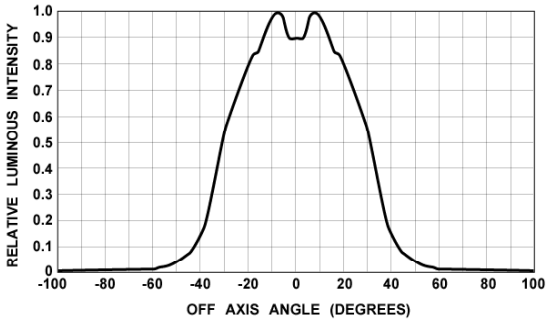


Figure 5e. HPWA-DX00 Relative Luminous Intensity vs. Off Axis Angle.

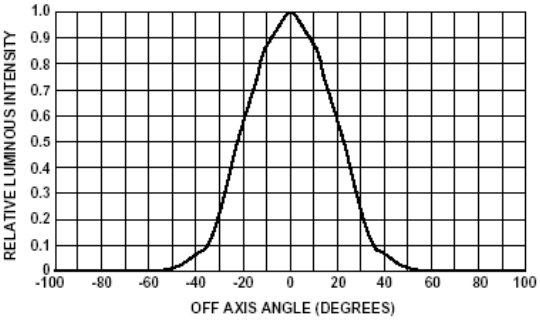


Figure 5f. HPWT-DX00 Relative Luminous Intensity vs. Off Axis Angle.

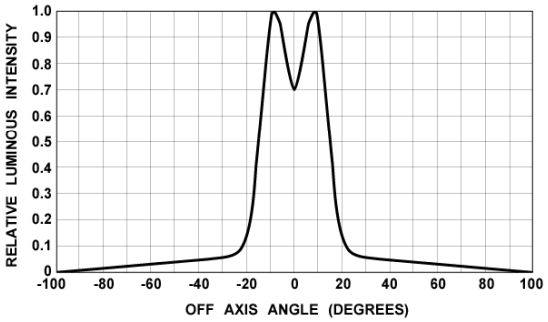


Figure 5g. HPWA-BX00 Relative Luminous Intensity vs. Off Axis Angle.

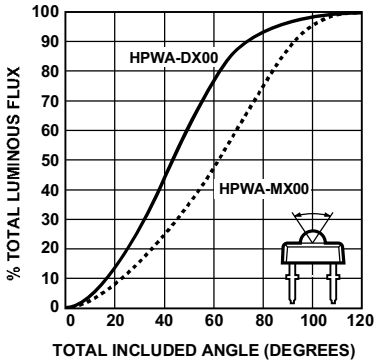


Figure 6a. HPWA-XX00 Percent Total Luminous Flux vs. Total Included Angle.

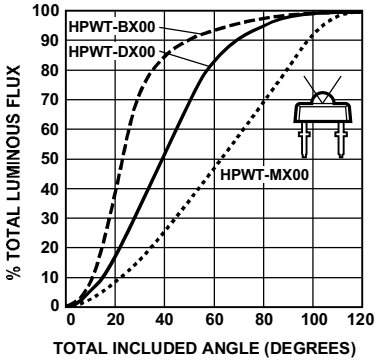


Figure 6b. HPWT-XX00 Percent Total Luminous Flux vs. Total Included Angle.

For additional information about Super Flux LEDs, please refer to Lumileds Application Note 1149. Copies of the application brief can be obtained from your local field sales engineer. You may also visit the Lumileds web site at www.lumileds.com.

LUMILEDS

LIGHT FROM SILICON VALLEY

Lumileds is a world-class supplier of Light Emitting Diodes (LEDs) producing billions of LEDs annually. Lumileds is a fully integrated supplier, producing core LED material in all three base colors (Red, Green, Blue) and White. Lumileds has R&D development centers in San Jose, California and Best, The Netherlands. Production capabilities in San Jose, California and Malaysia.

Lumileds is pioneering the high-flux LED technology and bridging the gap between solid state LED technology and the lighting world. Lumileds is absolutely dedicated to bringing the best and brightest LED technology to enable new applications and markets in the Lighting world.

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