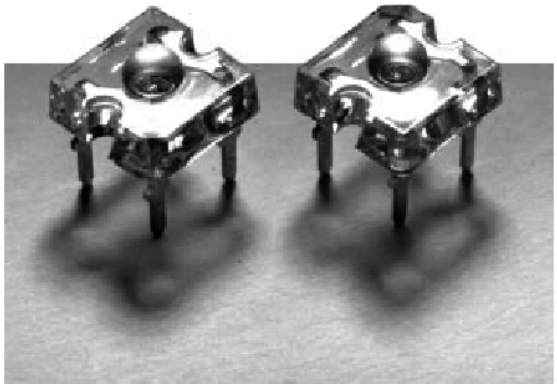
HPWA-MH00
HPWA-DH00
HPWT-RD00
HPWT-MD00
HPWT-DD00
HPWT-BD00
HPWT-RH00
HPWT-MH00
HPWT-DH00
HPWT-BH00
HPWT-RL00
HPWT-ML00
HPWT-DL00
HPWT-BL00
HPWN-MB00
HPWN-MC00
HPWN-MG00

SuperFlux LEDs

Technical Datasheet DS05

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, red-orange, amber, blue, cyan, and green LED materials, which allow designers to match the color of many lighting applications like vehicle signal lamps, specialty lighting, and electronic signs.



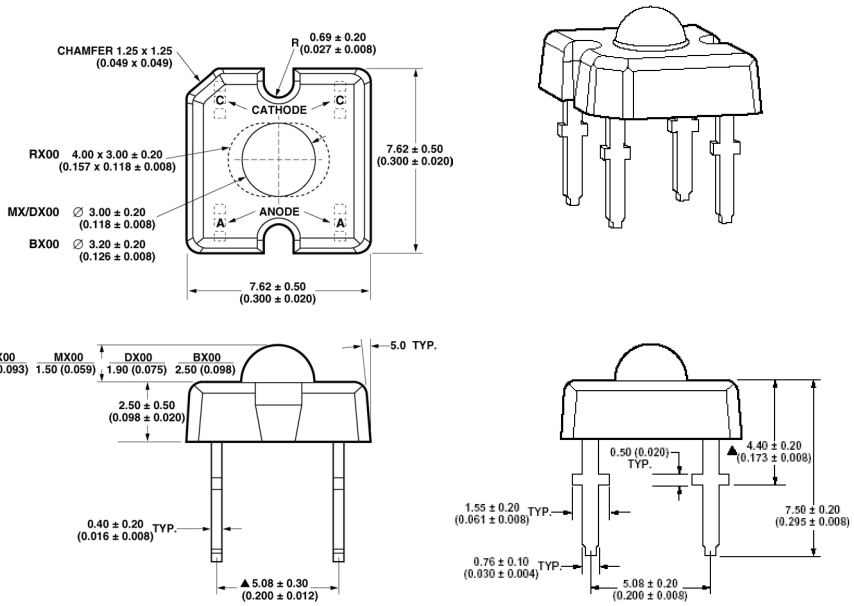
LUMILEDS™
LIGHT FROM SILICON VALLEY

Benefits
- Rugged Lighting Products
- Electricity Savings
- Maintenance Savings

Features
- High Luminance
- Uniform Color
- Low Power Consumption
- Low Thermal Resistance
- Low Profile
- Meets SAE/ECE/JIS Automotive Color Requirements
- Packaged in tubes for use with automatic insertion equipment

Typical Applications
- Automotive Exterior Lighting
- Electronic Signs and Signals
- Specialty Lighting

Outline Drawings



Selection Guide

Device Type	LED Color	Total flux Φ_V (lm) @ 70 mA[1] (HPWA, HPWT) 50 mA (HPWN) Typ.	Total Included angle $\theta_{90\,V}$ (Degrees)[2] Typ.
HPWA-MH00	AS AlInGaP Red-Orange	1.5	95
HPWA-DH00			75
HPWT-RD00	TS AlInGaP Red	3.5	44 X 88
HPWT-MD00			100
HPWT-DD00			70
HPWT-BD00			50
HPWT-RH00	TS AlInGaP Red-Orange	4.2	44 X 88
HPWT-MH00			100
HPWT-DH00			70
HPWT-BH00			50
HPWT-RL00	TS AlInGaP Amber	1.7	44 X 88
HPWT-ML00			100
HPWT-DL00			70
HPWT-BL00			50
HPWN-MB00	InGaN Blue	2.0	110
HPWN-MC00	InGaN Cyan	5.0	110
HPWN-MG00	InGaN Green	4.5	110

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

Absolute Maximum Ratings at T_A = 25 ºC

Parameter	HPWA	HPWT	HPWN	Units
DC Forward Current [1]	70	70	50	mA
Power Dissipation	187	221	233	mW
Reverse Voltage (I_R = 100 μ_A)	10	10	0.55	V
Operating Temperature Range		-40 to +100		°C
Storage Temperature Range		-55 to +100		°C
High Temperature Chamber		125°C, 2 Hours		
LED Junction Temperature		125°C		
Solder Conditions [2]				
Preheat Temperature		100°C for 30 seconds		
Solder Temperature		260°C for 5 seconds [1.5mm (0.06 in) below seating plane		

Notes:
1. De-rate as shown in Figures 4a, 4b and 4c.
2. Detailed wave soldering instructions are available.

Optical Characteristics at T_A = 25 °C, I_F = 70 mA HPWA, HPWT), I_F = 50 mA (HPWN) $R_{\theta J\text{-}A}$ = 200 °C/W

Device Type	Peak wavelength λ_{PEAK} (nm) Typ.	Dominant Wavelength λ_{DOM}(nm) [1] Typ.	Total Included Angle $\theta_{0.90\,V}$ (degrees) [2] Typ.	Luminous Intensity/ Total Flux I_v(cd)/Φ_v(lm) Typ.	Viewing Angle $\theta^{1/2}$ (Degrees) Typ.
HPWA-MHOO	624	618	95	0.6	90
HPWA-DHOO			75	0.9	60
HPWT-RDOO			44 X 88	1.25	25 x 68
HPWT-MDOO	640	630	100	0.6	70
HPWT-DDOO			70	1.5	40
HPWT-BDOO			50	2.0	30
HPWT-RHOO			44 X 88	1.25	25 x 68
HPWT-MHOO	626	620	100	0.6	70
HPWT-DHOO			70	1.5	40
HPWT-BHOO			50	2.0	30
HPWT-RLOO			44 X 88	1.25	25 x 68
HPWT-MLOO	596	594	100	0.6	70
HPWT-DLOO			70	1.5	40
HPWT-BLOO			50	2.0	30
HPWN-MBOO	460	470	110	0.9	90
HPWN-MCOO	503	505	110	0.9	90
HPWN-MGOO	520	525	110	0.9	90

Notes:
1. The dominant wavelength is derived from the CIE Chromaticity Diagram and represents the perceived color of the device.
2. $\theta_{0.90\ V}$ 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 (HPWA, HPWT) I_F = 50 mA (HPWN) Min	Typ	Max	Reverse Breakdown V_R (Volts) [1] @ I_R = 100 μ_A Min	Typ	Capacitance C (pF) V_F = 0, F = 1MHz. Typ	Thermal resistance $R\theta_{J\text{-}PIN}$ (°C/W) Typ	Speed of Response τ_s (ns) [2] Typ
HPWA-xHOO	1.83	2.1	2.67	10	20	40	155	20
HPWT-xDOO	2.19	2.5	3.03	10	20	40	125	20
HPWT-xHOO	2.19	2.5	3.03	10	20	40	125	20
HPWT-xLOO	2.19	2.6	3.15	10	20	40	125	20
HPWN-xBOO	3.29	3.8	4.66	0.55	0.65	1900	130	20
HPWN-xCOO	3.29	3.8	4.66	0.55	0.65	1900	130	20
HPWN-xGOO	3.29	3.9	4.66	0.55	0.65	1900	130	20

Notes:
1. Operation in reverse bias is not recommended.
2. τ_s is the time constant, $e^{-t/\tau s}$.

Part Number Selection

Red

Part Number	Description	Viewing Angle $\theta^{1/2}$ (Deg.)	Min. Flux[1] ΦV (lm)	Max. Flux ΦV (lm)	Minimum Intensity (cd)	Maximum Intensity (cd)
HPWT-RDOO-OOOOO		25x68	1.5		1.9	
HPWT-RDOO-D4OOO		25x68	2.0	4.8	2.5	6.0
HPWT-RDOO-E4OOO		25x68	2.5	6.1	3.1	7.6
HPWT-RDOO-F4OOO		25x68	3.0	7.3	3.8	9.1
HPWT-BDOO-OOOOO		30	1.5		3.0	
HPWT-BDOO-D4OOO		30	2.0	4.8	4.0	9.6
HPWT-BDOO-E4OOO		30	2.5	6.1	5.0	12.2
HPWT-BDOO-F4OOO	SuperFlux LED	30	3.0	7.3	6.0	14.6
HPWT-DDOO-OOOOO		40	1.5		2.3	
HPWT-DDOO-D4OOO		40	2.0	4.8	3.0	7.2
HPWT-DDOO-E4OOO		40	2.5	6.1	3.8	9.2
HPWT-DDOO-F4OOO		40	3.0	7.3	4.5	11.0
HPWT-MDOO-OOOOO		70	1.5		0.9	
HPWT-MDOO-D4OOO		70	2.0	4.8	1.2	2.9
HPWT-MDOO-E4OOO		70	2.5	6.1	1.5	3.7
HPWT-MDOO-F4OOO		70	3.0	7.3	1.8	4.4

1. ΦV is the total luminous flux output as measured with an integrating sphere after the device has stabilized.

Red-Orange

Part Number	Description	Viewing Angle $\theta^{1/2}$ (Deg.)	Min. Flux ΦV (lm)	Max. Flux ΦV (lm)	Minimum Intensity (cd)	Maximum Intensity (cd)
HPWT-RHOO-OOOOO		25x68	1.5		1.9	
HPWT-RHOO-D4OOO		25x68	2.0	4.8	2.5	6.0
HPWT-RHOO-E4OOO		25x68	2.5	6.1	3.1	7.6
HPWT-RHOO-F4OOO		25x68	3.0	7.3	3.8	9.1
HPWT-RHOO-G4OOO		25x68	3.5	9.7	4.4	12.1
HPWT-RHOO-H4OOO		25x68	4.0	12.0	5.0	15.0
HPWT-BHOO-OOOOO		30	1.5		3.0	
HPWT-BHOO-D4OOO		30	2.0	4.8	4.0	9.6
HPWT-BHOO-E4OOO		30	2.5	6.1	5.0	12.2
HPWT-BHOO-F4OOO		30	3.0	7.3	6.0	14.6
HPWT-BHOO-G4OOO		30	3.5	9.7	7.0	19.4
HPWT-BHOO-H4OOO		30	4.0	12.0	8.0	24.0
HPWT-DHOO-OOOOO		40	1.5		2.3	
HPWT-DHOO-D4OOO	SuperFlux LED	40	2.0	4.8	3.0	7.2
HPWT-DHOO-E4OOO		40	2.5	6.1	3.8	9.2
HPWT-DHOO-F4OOO		40	3.0	7.3	4.5	11.0
HPWT-DHOO-G4OOO		40	3.5	9.7	5.3	14.6
HPWT-DHOO-H4OOO		40	4.0	12.0	6.0	18.0
HPWT-MHOO-OOOOO		70	1.5		0.9	
HPWT-MHOO-D4OOO		70	2.0	4.8	1.2	2.9
HPWT-MHOO-E4OOO		70	2.5	6.1	1.5	3.7
HPWT-MHOO-F4OOO		70	3.0	7.3	1.8	4.4
HPWT-MHOO-G4OOO		70	3.5	9.7	2.1	5.8
HPWT-MHOO-H4OOO		70	4.0	12.0	2.4	7.2
HPWA-MHOO-B4OOO		90	1.0	3.6	0.6	2.2
HPWA-DHOO-B4OOO		40	1.0	3.6	1.5	5.4
HPWA-MHOO-C4OOO		90	1.5	4.2	0.9	2.5
HPWA-DHOO-C4OOO		40	1.5	4.2	2.3	6.3

Amber

Part Number	Description	Viewing Angle $\theta^{1/2}$ (Deg.)	Min. Flux ΦV (lm)	Max. Flux ΦV (lm)	Minimum Intensity (cd)	Maximum Intensity (cd)
HPWT-RL00-00000	SuperFlux LED	25x68	1.0		1.3	
HPWT-RL00-C4000		25x68	1.5	4.2	1.9	5.3
HPWT-RL00-D4000		25x68	2.0	4.8	2.5	6.0
HPWT-BL00-00000		30	1.0		2.0	
HPWT-BL00-C4000		30	1.5	4.2	3.0	8.4
HPWT-BL00-D4000		30	2.0	4.8	4.0	9.6
HPWT-DL00-00000		40	1.0		1.5	
HPWT-DL00-C4000		40	1.5	4.2	2.3	6.3
HPWT-DL00-D4000		40	2.0	4.8	3.0	7.2
HPWT-ML00-00000		70	1.0		0.6	
HPWT-ML00-C4000		70	1.5	4.2	0.9	2.5
HPWT-ML00-D4000		70	2.0	4.8	1.2	2.9

Green

Part Number	Description	Viewing Angle $\theta^{1/2}$ (Deg.)	Min. Flux ΦV (lm)	Max. Flux ΦV (lm)	Minimum Intensity (cd)	Maximum Intensity (cd)
HPWN-MG00-00000	SuperFlux LED	90	3.0		2.7	

Cyan

Part Number	Description	Viewing Angle $\theta^{1/2}$ (Deg.)	Min. Flux ΦV (lm)	Max. Flux ΦV (lm)	Minimum Intensity (cd)	Maximum Intensity (cd)
HPWN-MC00-00000	SuperFlux LED	90	3.0		2.7	

Blue

Part Number	Description	Viewing Angle $\theta^{1/2}$ (Deg.)	Min. Flux ΦV (lm)	Max. Flux ΦV (lm)	Minimum Intensity (cd)	Maximum Intensity (cd)
HPWN-MB00-00000	SuperFlux LED	90	1.0		0.9	

Figures

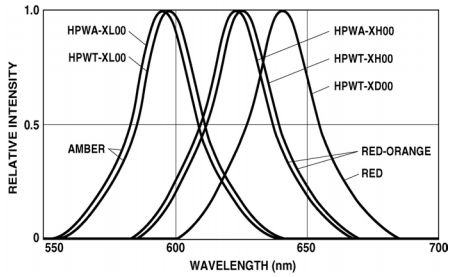


Figure 1a. Relative Intensity vs. Wavelength

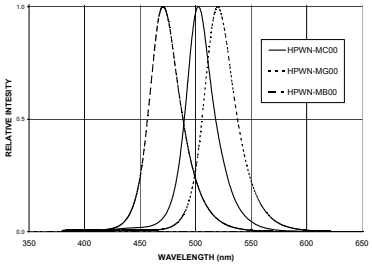


Figure 1b. Relative Intensity vs. Wavelength (HPWN)

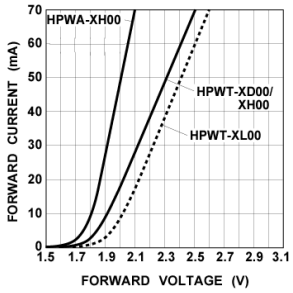


Figure 2a. Forward Current vs. Forward Voltage

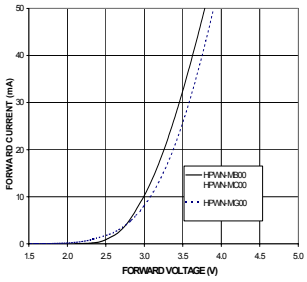


Figure 2b. Forward Current vs. Forward Voltage

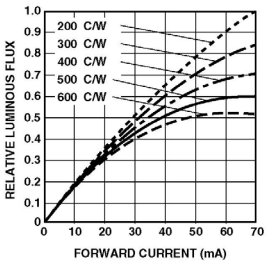


Figure 3. HPWA/HPWT-xx00 Relative Luminous Flux vs. Forward Current.

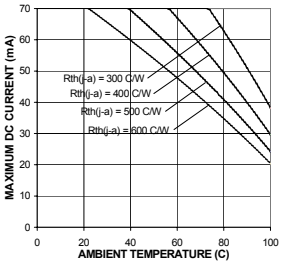


Figure 4a. HPWA-xx00 Maximum DC Forward Current vs. Ambient Temperature.

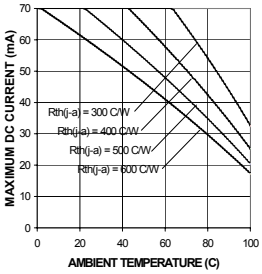


Figure 4b. HPWT-xx00 Maximum DC Forward Current vs. Ambient Temperature.

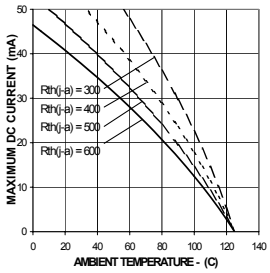


Figure 4c. HPWN-xx00 Maximum DC Forward Current vs. Ambient Temperature.

Note:
1.24 mm^2 of Cu pad per emitter at cathode lead is recommended for lowest thermal resistance.

Figures

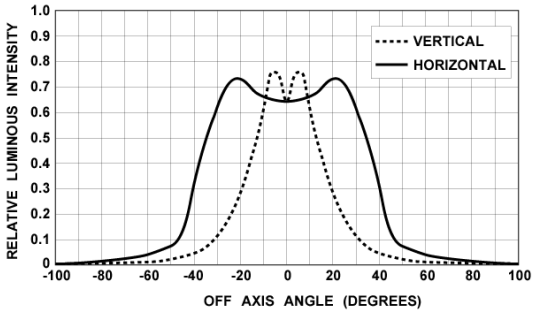


Figure 5a. HPWT-Rx00 Relative Luminous Intensity vs. Off Axis Angle.

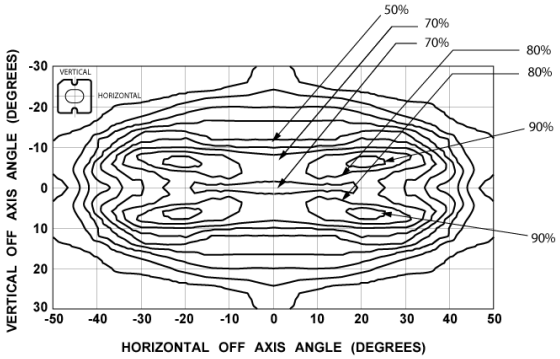


Figure 5b. HPWT-Rx00 Relative Luminous Intensity vs. Off Axis Angle.
Iso-Intensity Contour Plot.

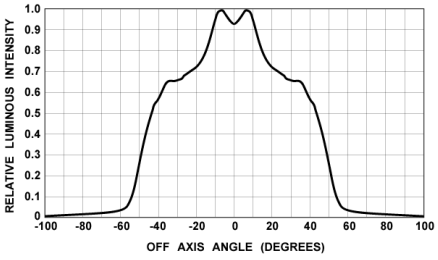


Figure 5c. HPWA-Mx00 Relative Luminous Intensity vs. Off Axis Angle.

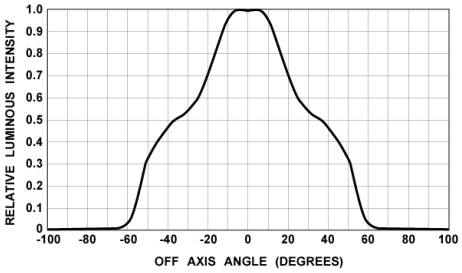


Figure 5d. HPWT-Mx00 Relative Luminous Intensity vs. Off Axis Angle.

Figures

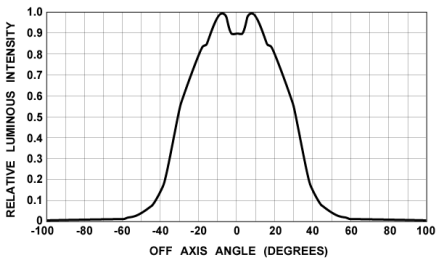


Figure 5e. HPWA(T)-Dx00 Relative Luminous Intensity vs. Off Axis Angle.

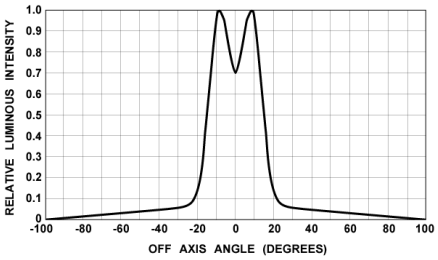


Figure 5f. HPWT-Bx00 Relative Luminous Intensity vs. Off Axis Angle.

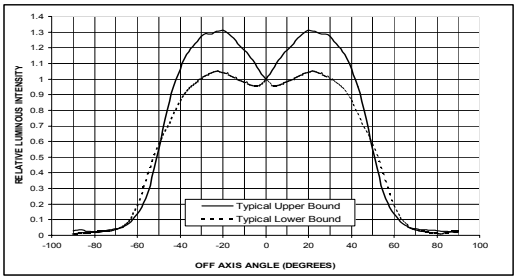


Figure 5g. HPWN-Mx00 Relative Luminous Intensity vs. Off Axis Angle

Company Information

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.

Lumileds may make process or materials changes affecting the performance or other characteristics of our products. These products supplied after such changes will continue to meet published specifications, but may not be identical to products supplied as samples or under prior orders.

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