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Electrical Drive Information
LUXEON® I Products

Driving a Single LUXEON Light Source

LEDs should be driven at a constant current. The power dissipation causes the LED to heat up. Excessive heat destroys the LED. Please follow Application Brief 05 *LUXEON® Thermal Design Guide* which can be downloaded at www.luxeon.com to ensure proper heat management.

At room temperature (25°C)

- A LUXEON Star (Fig.1) may be driven at it's maximum rated current of 350 mA. The anode lead is denoted by a dot or a "+", anode is the left side of AMP connector on the Star/C when facing toward you. The temperature of the back of the MCPCB may reach 60°C if no additional heatsinking is provided.
- A LUXEON Emitter (Fig. 2) must be driven at a reduced current of maximum 100 mA due to the lack of a heat sink. The anode lead is denoted by a hole in the leadframe. The back of the device is not electrically neutral and must be isolated from the leads.

Figure 1. LUXEON Star

Figure 2. LUXEON Emitter

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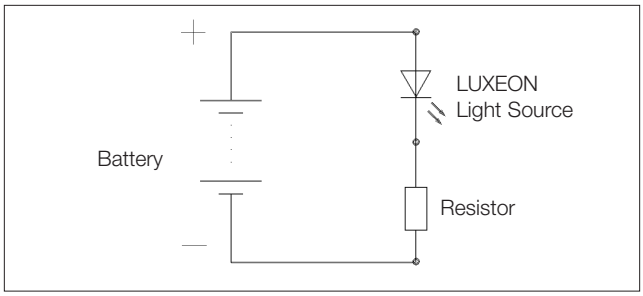

Figure 3. Using Batteries

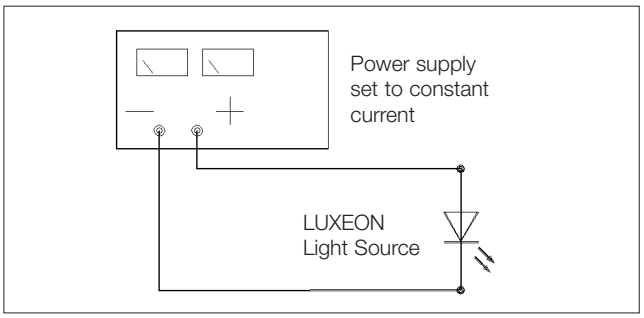

Figure 4. Constant Current Mode

Table 1. Using Batteries (AA, 9V block) - see Figure 3

Battery Configuration	Resistors for LUXEON Star		Resistors for LUXEON Emitter	
	Vf-bin E-G	Vf-bin H-L	Vf-bin E-G	Vf-bin H-L
4 AA batteries (~6V)	11Ω / 1W	8Ω / 1W	30Ω / 0.5W	22Ω / 0.5W
9 V block	16Ω / 2W		49Ω / 1W	

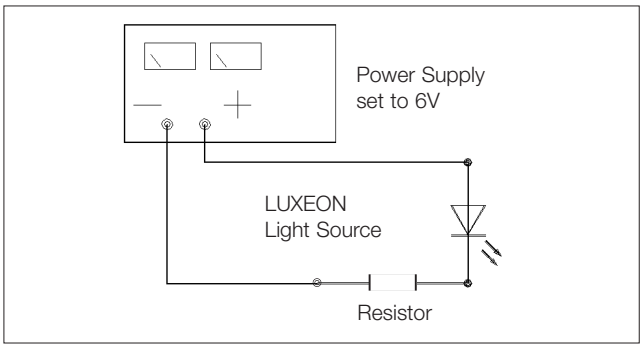

Figure 5. Constant Voltage Mode

Table 2. Using Power Supplies (Figure 4 or Figure 5)

	LUXEON Star		LUXEON Emitter	
Current setting (constant current mode) - see Fig. 4	350mA		100mA	
Voltage setting (constant voltage mode) - see Fig. 5	Resistor @ 6V (const.) Vf-bin E-G 11Ω / 1W	Vf-bin H-L 8Ω / 1W	Resistor @ 6V (const.) Vf-bin E-G 30Ω / 0.5W	Vf-bin H-L 22Ω / 0.5W

Typical Characteristics at 350mA, Junction Temperature T_J = 25°C

Radiation Pattern	Color	Typical Dominant Wavelength [1] λD or CCT	Forward Test Current (mA) I_F	Typical Forward Voltage V_F (V)	Minimum Luminous Flux (lm) Φ_V [1]	Typical Luminous Flux (lm) Φ_V
Batwing	White	5500K	350	3.42	30.6	45
	Green	530 nm	350	3.42	30.6	53
	Cyan	505 nm	350	3.42	30.6	45
	Blue[2]	470 nm	350	3.42	8.2	16
	Royal Blue[3]	455 nm	350	3.42	145 mW	220 mW
	Red[5]	625 nm	350	2.85	13.9	42
	Amber[5]	590 nm	350	2.85	10.7	42
Lambertian	Green	530 nm	350	3.42	30.6	53
	Cyan	505 nm	350	3.42	30.6	45
	Blue[2]	470 nm	350	3.42	8.2	16
	Royal Blue[3]	455 nm	350	3.42	145 mW	220 mW
	Red[5]	627 nm	350	2.95	30.6	44
	Red-Orange[5]	617 nm	350	2.95	39.8	55
	Amber[5]	590 nm	350	2.95	23.5	42

Notes:

1. Minimum luminous flux performance guaranteed within published operating conditions. LUXEON types with even higher luminous flux levels will become available in the future. Flux values for LUXEON emitters and stars without secondary optics. The efficiency of the collimating optic is approximately 85%.
2. Minimum flux value for 470 nm devices. Due to the CIE eye response curve in the short blue wavelength range, the minimum luminous flux will vary over the Lumileds blue color range. Luminous flux will vary from a minimum of 2.9lm at 460 nm to a typical of 8lm at 480 nm due to this effect.
3. The typical radiometric flux for Royal Blue LUXEON is 120 mW.
4. All power light sources represented here are IEC825 Class 2 for eye safety.
5. More details on Amber and Red are found in DS25.

Absolute Maximum Ratings

Parameter	White/Green/Cyan Blue/Royal Blue	Red/Amber Red-Orange
DC Forward Current (mA) [1]	350	385
Peak Pulsed Forward Current (mA)	500	550
Average Forward Current (mA)	350	350
LED Junction Temperature (°C)	120	120
Aluminum-Core PCB Temperature (°C)	105	105
Storage Temperature (°C) Emitter, Star, Star/C	-40 to +120	-40 to +120
Storage Temperature (°C) Star/O (w/ collimating optic)	-40 to +75	-40 to +75
Soldering Temperature (°C)[3]	260 for 5 seconds max	260 for 5 seconds max

Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum.
2. All products are not sensitive to ESD damage (+/-16,000 Volts by HBM condition).
3. Measured at leads, during lead soldering and slug attach, body temperature must not exceed 120°C. LUXEON emitters cannot be soldered by general IR or Vapor-phase reflow, nor by wave soldering. Lead soldering is limited to selective heating of the leads, such as by hot-bar reflow, fiber focused IR, or hand soldering. The package back plane (slug) may not be attached by soldering, but rather with a thermally conductive adhesive. Electrical insulation between the slug and the board is required. Please consult Lumileds Application Brief on LUXEON Emitter Assembly Information for further details on assembly methods.

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Company Information

LUXEON® is developed, manufactured and marketed by Philips Lumileds Lighting Company. Philips Lumileds is a world-class supplier of Light Emitting Diodes (LEDs) producing billions of LEDs annually. Philips Lumileds is a fully integrated supplier, producing core LED material in all three base colors (Red, Green, Blue) and White. Philips Lumileds has R&D centers in San Jose, California and in The Netherlands and production capabilities in San Jose and Penang, Malaysia. Founded in 1999, Philips Lumileds is the high-flux LED technology leader and is dedicated to bridging the gap between solid-state LED technology and the lighting world. Philips Lumileds technology, LEDs and systems are enabling new applications and markets in the lighting world.

Philips 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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FOR TECHNICAL ASSISTANCE OR THE LOCATION OF YOUR NEAREST SALES OFFICE CONTACT ANY OF THE FOLLOWING:

NORTH AMERICA:
+1 888 589 3662 OR
ASKLUXEON@FUTUREELECTRONICS.COM

EUROPE:
00 800 443 88 873 OR
LUXEON.EUROPE@FUTUREELECTRONICS.COM

ASIA:
800 5864 5337 OR
LUMILEDS.ASIA@FUTUREELECTRONICS.COM

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