Migrating from LUXEON K2 to LUXEON Rebel

LUXEON Rebel Advantages:

- Deliver more usable light and higher flux density.
- Optimize applications to reduce size and cost.
- Tightly pack the LEDs for mixing.
- Engineer more robust applications.
- Utilize standard lower cost FR4 PCB technology.
- Unsurpassed reliability performance.
- Exceed ENERGY STAR® lumen maintenance requirements.
- Specified CCT & CRI combinations.
- ANSI compliant binning.
- High efficacy for sustainable design.
- Deliver 100 lm/W Performance at 350mA.
- Higher Efficiency means less Power Consumption with same performance

Light Output / LED Count:

- The higher flux bin parts of both LUXEON K2 and LUXEON Rebel at their respective nominal currents of 1000mA and 350mA have comparable light output.
- Keeping the same number of LEDs, while driving them at nominal current – enables lower cost thermal solution.

Results from ULT	***LXK2-PW14-V00***	***LXML-PWC1-0100****
Number of LEDs	1	1
Drive Current (mA)	1000	350
Light Output (lumens)	100	99
Junction Temperature (°C)	103	45
Power Consumption (W)	3.5	1.1

* This part number was chosen as an example. Other flux bins may be leveraged

- Keeping the same number of LEDs, while driving them at maximum current, results in increased light output and lower junction temperature, enabling lower cost thermal solution.

Results from ULT	***LXK2-PW14-V00***	***LXML-PWC1-0100****
Number of LEDs	1	1
Drive Current (mA)	1500	1000
Light Output (lumens)	126	193
Junction Temperature (°C)	117	78
Power Consumption (W)	5.7	3.8

* This part number was chosen as an example. Other flux bins may be leveraged

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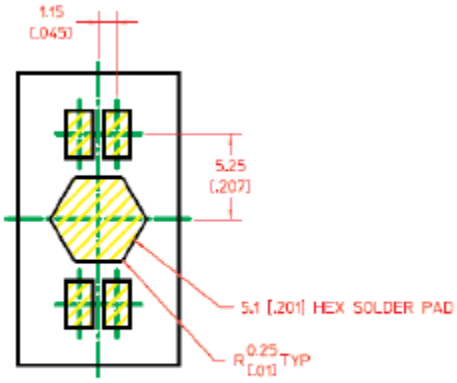
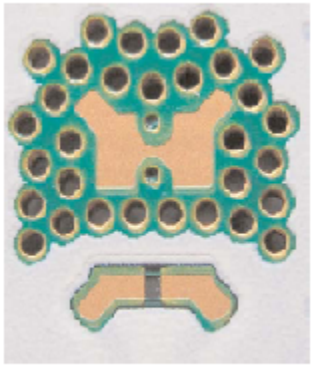
Making LED Lighting Solutions Simple™

Mechanical Characteristics:

- LUXEON Rebel has a smaller package; therefore, the board design needs to be modified to accommodate the new footprint.
- LUXEON Rebel can be supplied on a star board.
- If MCPCB was in use, it is recommended to change it to the lower cost FR4 board and accordingly add thermal vias to the board as per the recommended layout.
- Please refer to AB32 for more information.



Pad layout for LUXEON K2



Pad layout for LUXEON Rebel

Optical Characteristics:

- Optics need to be changed to correspond to the optical and mechanical properties of the LUXEON Rebel.
- Refer to the ray-set files for optical characteristics.
- Suggested optics alternatives for transitioning to LUXEON Rebel include:

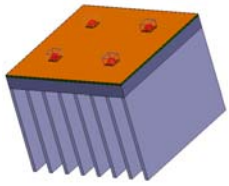
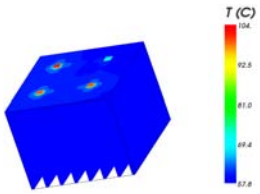
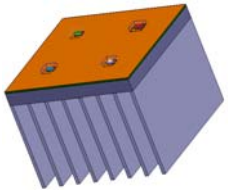
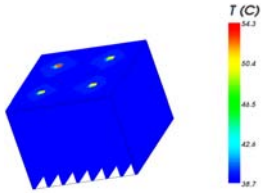
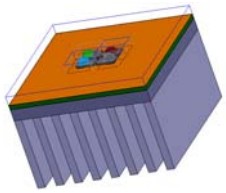
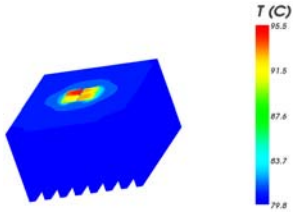
Beam angle	***LUXEON K2 Optics***	***LUXEON Rebel Optics***
Narrow	Carclo: 10003	Carclo: 10193
	Fraen: FLP-N4-K2-HRF	Fraen: FLP-N4-RE-HRF
	Polymer: 120/151	Polymer: 120/180
Medium	Carclo: 10108	Carclo: 10412
	Khatod: PL26625LSD	Khatod: PL119840
Wide	Carclo: 10003/25	Carclo: 10414
	Polymer: 124/151	Polymer: 124/180
	Khatod: KEPL119640	Khatod: KEPL115440
Tri-lens	Polymer: 157/160	Polymer: 181/160

Thermal Characteristics:

- Although LUXEON K2 has a lower thermal resistance than LUXEON Rebel, its impact can be offset by:
  - The higher efficiency of LUXEON Rebel
  - The higher lumen maintenance junction temperature of LUXEON Rebel (135°C) compared to the LUXEON K2 (120°C for white)
- Thermal design may be modified to a smaller size/lower cost solution
- Please refer to AB33 for more information

Color Mixing (RGBW) – Thermal performance:

- The smaller package and higher efficiency of LUXEON Rebel enables smaller size/lower cost thermal solution.

Results from QLED				
LED Driven at Nominal Current*	***LED Assembly***	***Junction Temperature (Tj)***	***Light Output***	***Thermal model***
LUXEON K2		**Red: 73°C Green: 104°C Blue: 102°C White: 102°C**	**Red: 30 lm Green: 89 lm Blue: 21 lm White: 100 lm**	
LUXEON Rebel		**Red: 53°C Green: 54°C Blue: 50°C White: 52°C**	**Red: 29 lm Green: 80 lm Blue: 24 lm White: 88 lm**	
LUXEON Rebel – tightly packed with optimized thermal solution		**Red: 95°C Green: 95°C Blue: 92°C White: 94°C**	**Red: 20 lm Green: 74 lm Blue: 22 lm White: 80 lm**	

*Nominal current is 1A for LUXEON K2 InGaN and 350mA for LUXEON K2 AlInGaP and LUXEON Rebel

Power Characteristics:

- Since higher flux LEDs are more efficient than lower flux LEDs:
  - Less power consumed to provide the same light output
  - Allows for smaller lower wattage power supply solutions