

# EZR260™ LEDs

## CxxxEZ260-Sxx00

Cree's EZBright LEDs are the next generation of solid-state LED emitters that combine highly efficient InGaN materials with Cree's proprietary optical design and wafer-level submount technology to deliver superior value for high-intensity LEDs. The optical design maximizes light extraction efficiency and enables a Lambertian radiation pattern. Additionally, these LEDs are die attachable with conductive epoxy. These vertically structured, low forward voltage LED chips are approximately 100 microns in height and require only a single wire bond connection. Cree's EZ™ LED chips are tested for conformity to optical and electrical specifications. Applications for EZBright Rectangular LEDs include next-generation mobile appliances for use in their LCD backlights and digital camera flash where brightness, subminiaturization, and low power consumption are required.

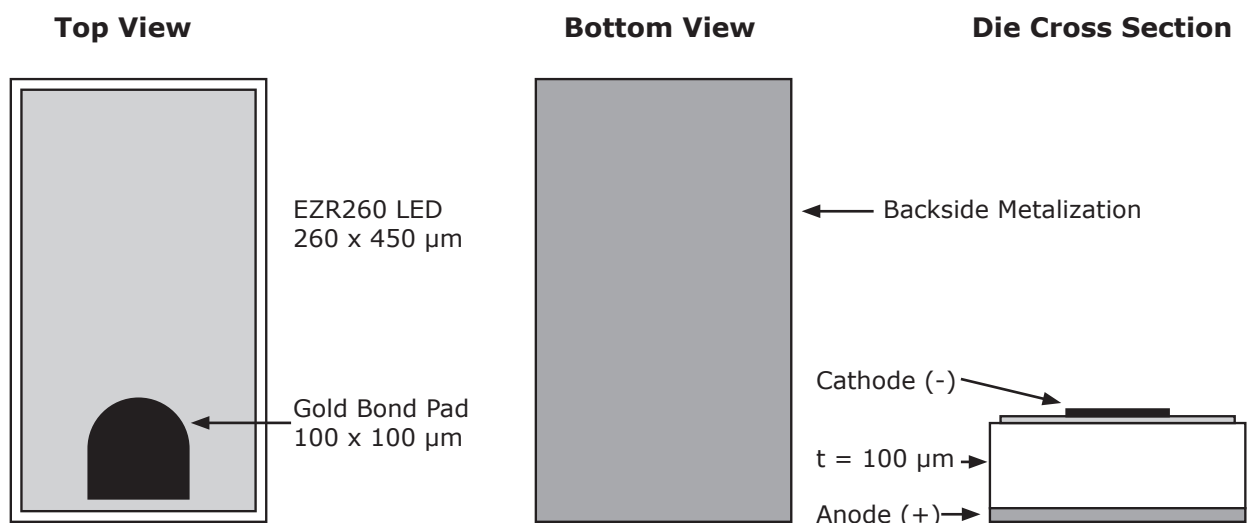
### FEATURES

- EZBright Rectangular LED Rf Performance
  - 450 & 460 nm
    - ◆ EZR-24™ - 24-27 mW
    - ◆ EZR-27™ - 27-30 mW
    - ◆ EZR-30™ - 30-33 mW
  - 470 nm
    - ◆ EZR-21™ - 21-24 mW
    - ◆ EZR-27™ - 24-27 mW
    - ◆ EZR-30™ - 27-30 mW
- Lambertian Radiation
- Conductive-Epoxy Die Attach
- Low Forward Voltage - 3.2 V Typical at 20 mA

### APPLICATIONS

- LCD Backlighting
  - Mobile Appliance
  - Digital Cameras
  - Monitors
- Digital Still Camera Flash
- Audio Product Display Lighting

### CxxxEZR260-Sxx00 Chip Diagram



Maximum Ratings at $T_A = 25^\circ\text{C}$ <small>Notes 1&amp;3</small>		CxxxEZ290-Sxx00
DC Forward Current		30 mA
Peak Forward Current (1/10 duty cycle @ 1 kHz)		100 mA
LED Junction Temperature		125°C
Reverse Voltage		5 V
Operating Temperature Range		-40°C to +100°C
Storage Temperature Range		-40°C to +100°C
Electrostatic Discharge Threshold (HBM) <small>Note 2</small>		400 V
Electrostatic Discharge Classification (MIL-STD-883E) <small>Note 2</small>		Class 1

Typical Electrical/Optical Characteristics at $T_A = 25^\circ\text{C}$ , $I_f = 20\text{ mA}$ <small>Note 3</small>					
Part Number	Forward Voltage ( $V_f$ , V)			Reverse Current [ $I(V_r=5V)$ , $\mu\text{A}$ ]	Full Width Half Max ( $\lambda_{DF}$ , nm)
	Min.	Typ.	Max.	Max.	Typ.
C450EZR260-Sxx00	2.7	3.2	3.7	2	20
C460EZR260-Sxx00	2.7	3.2	3.7	2	21
C470EZR260-Sxx00	2.7	3.2	3.7	2	22

Mechanical Specifications		CxxxEZ290-Sxx00	
Description	Dimension	Tolerance	
P-N Junction Area ( $\mu\text{m}$ )	250 x 430	$\pm 25$	
Chip Area ( $\mu\text{m}$ )	260 x 450	$\pm 25$	
Chip Thickness ( $\mu\text{m}$ )	100	$\pm 15$	
Au Bond Pad Diameter ( $\mu\text{m}$ )	100 x 100	-5, +15	
Au Bond Pad Thickness ( $\mu\text{m}$ )	2.0	$\pm 0.5$	
Back Contact Metal Area ( $\mu\text{m}$ )	260 x 450	$\pm 25$	

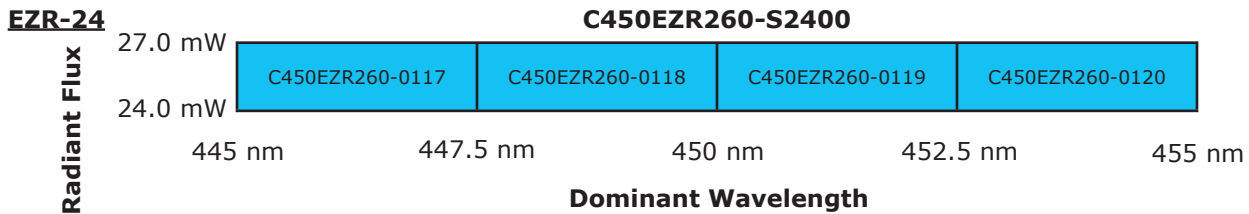
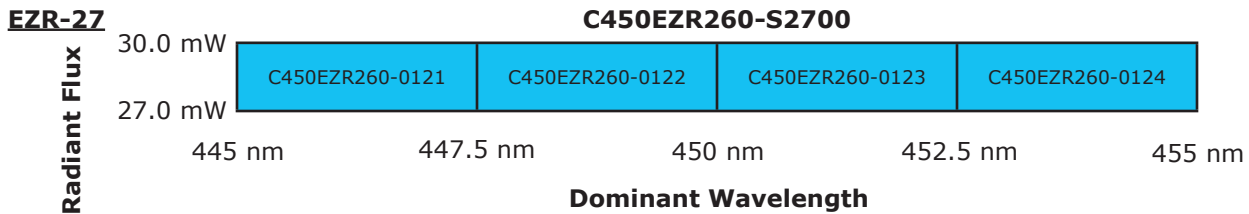
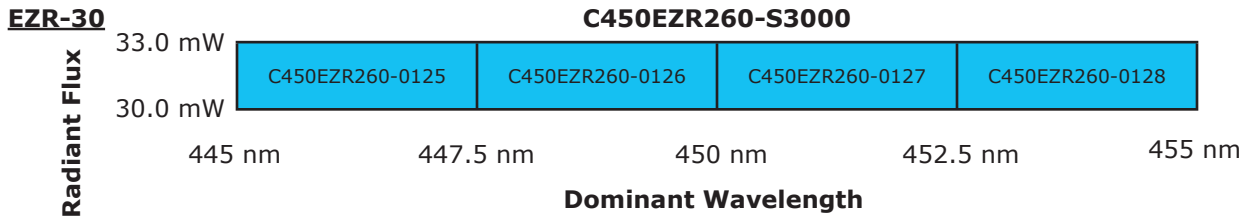
### Notes:

1. Maximum ratings are package dependent. The above ratings were determined using a T-1 3/4 package (with Hysol OS4000 epoxy) for characterization. Ratings for other packages may differ. The forward currents (DC and Peak) are not limited by the die but by the effect of the LED junction temperature on the package. The junction temperature limit of 125°C is a limit of the T-1 3/4 package; junction temperature should be characterized in a specific package to determine limitations. Assembly processing temperature must not exceed 270°C (< 10 seconds). See Cree EZBright Applications Note for assembly process information.
2. Product resistance to electrostatic discharge (ESD) according to the HBM is measured by simulating ESD using a rapid avalanche energy test (RAET). The RAET procedures are designed to approximate the maximum ESD ratings shown. The RAET procedure is performed on each die. The ESD classification of Class 1 is based on sample testing according to MIL-STD-883E.
3. All products conform to the listed minimum and maximum specifications for electrical and optical characteristics when assembled and operated at 20 mA within the maximum ratings shown above. Efficiency decreases at higher currents. Typical values given are within the range of average values expected by manufacturer in large quantities and are provided for information only. All measurements were made using lamps in T-1 3/4 packages (with Hysol OS4000 epoxy). Optical characteristics measured in an integrating sphere using Illuminance E.
4. Specifications are subject to change without notice.

## Standard Bins for CxxxEZR20-Sxx00

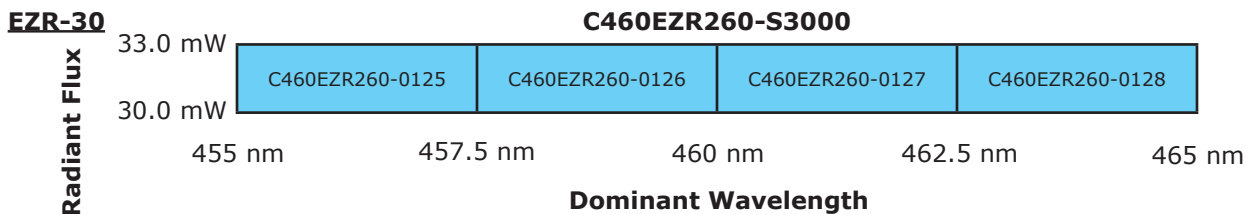
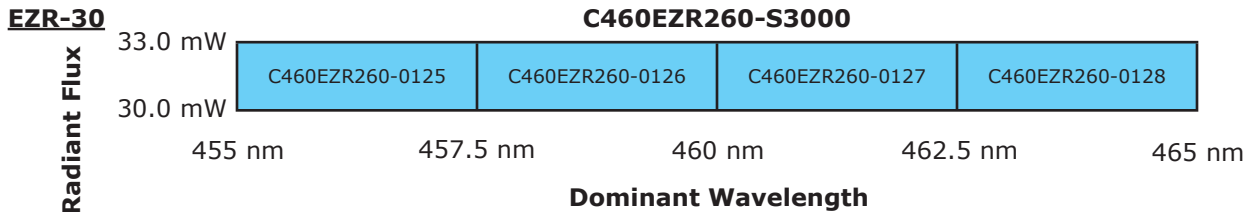
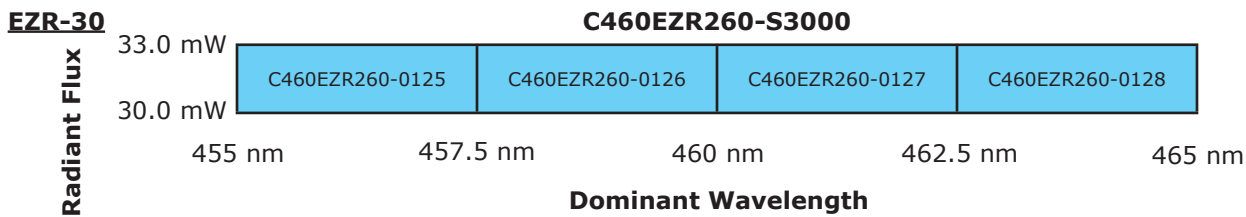
LED chips are sorted to the **radiant flux** and **dominant wavelength** bins shown. A sorted die sheet contains die from only one bin. Sorted die kit (CxxxEZR260-Sxxxx) orders may be filled with any or all bins (CxxxEZR260-xxxx) contained in the kit. All radiant flux and dominant wavelength values shown and specified are at  $I_f = 20$  mA.

### EZR 450 nm Kits

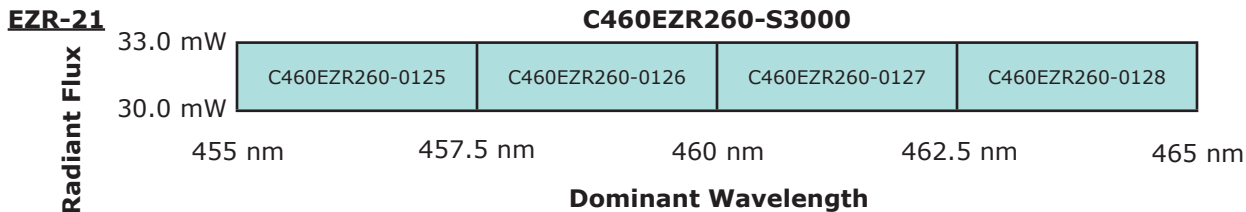
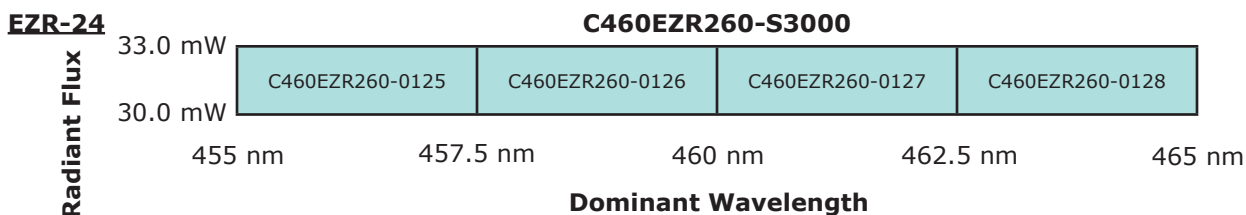
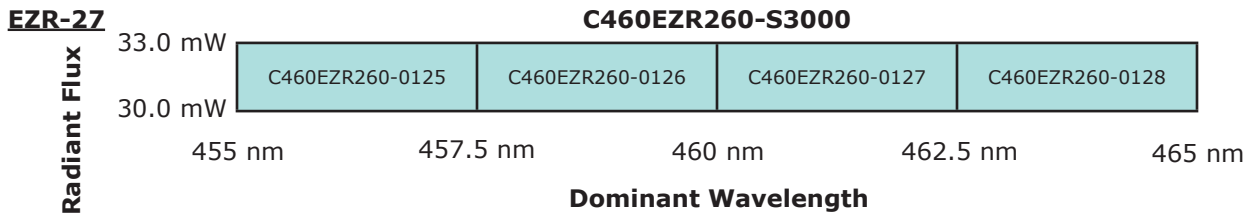


**Standard Bins for EZR260 (continued)**

**EZR 460 nm Kits**

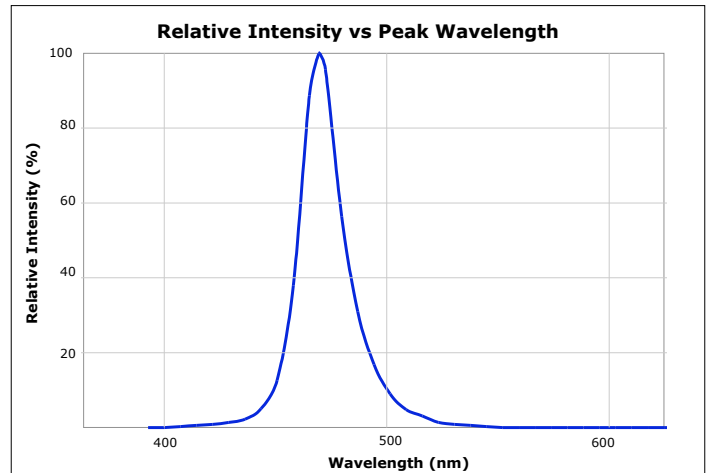
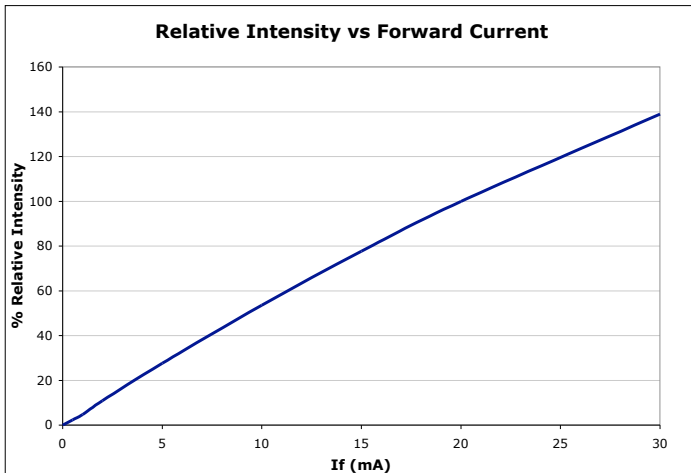
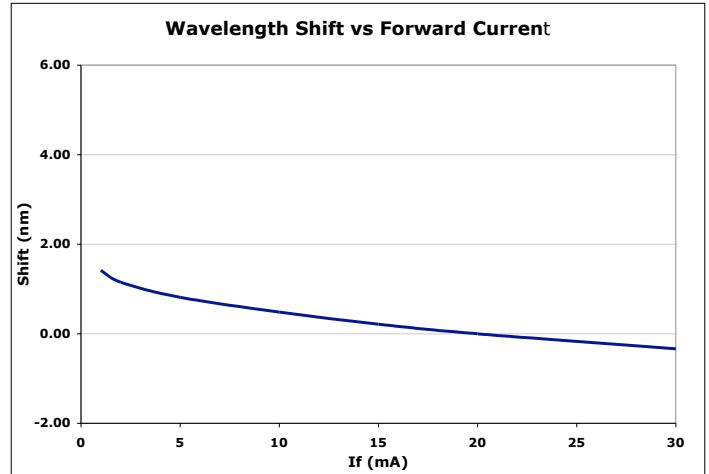
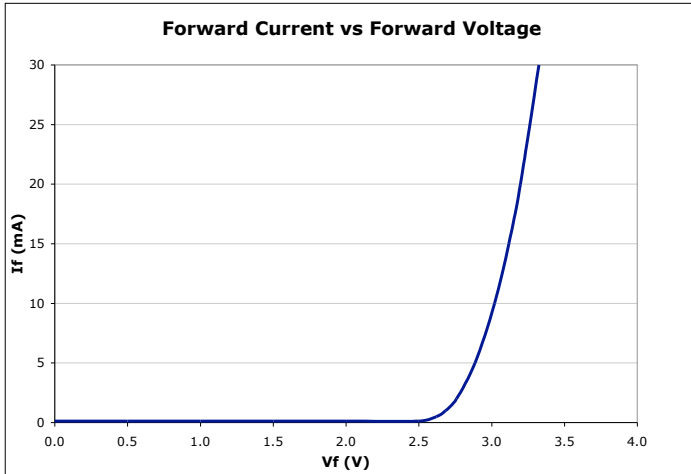


**EZR 460 nm Kits**



## Characteristic Curves

This is a representative radiation pattern for the EZR260 LED product. Actual patterns will vary slightly for the various radiant flux and dominant wavelength bins.



## Radiation Pattern

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This is a representative radiation pattern for the EZBright LED product. Actual patterns will vary slightly for each chip.

