Cree® EZ700™ LED

Data Sheet

CxxxEZ700-Sxx000

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 device 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, solder paste or solder preforms, in addition to using the flux eutectic method. These vertically structured, low forward voltage LED chips are approximately 100 microns in height. Cree's EZ™ chips are tested for conformity to optical and electrical specifications and the ability to withstand 1000 V ESD. These LEDs are useful in a broad range of applications, such as general illumination, automotive lighting and LCD backlighting.

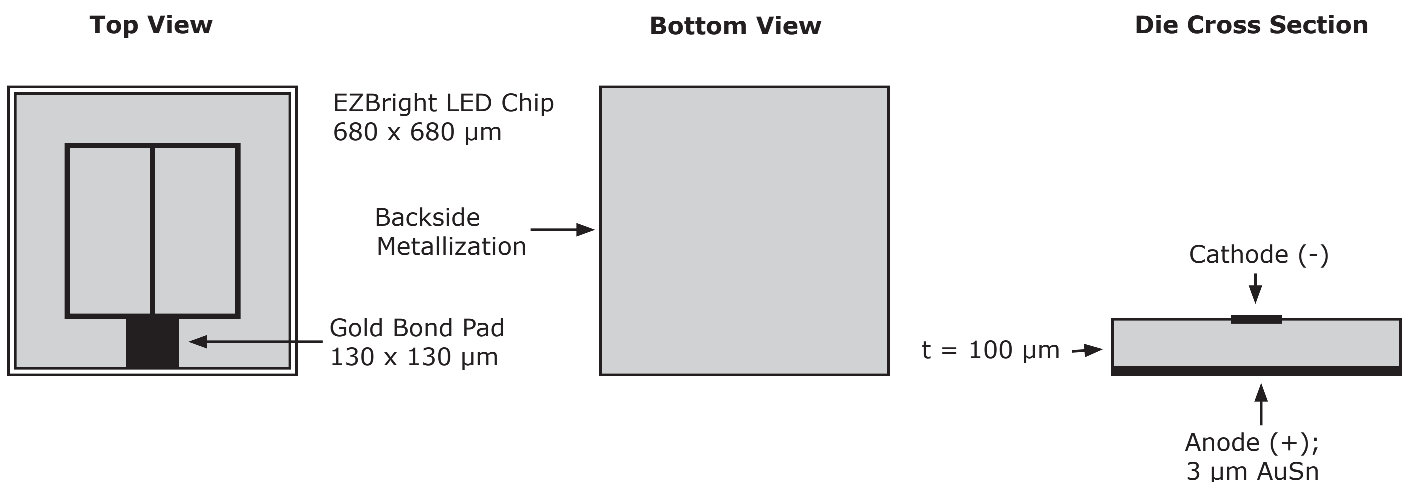
FEATURES

- EZBright Power Chip LED Rf Performance
  - 200 mW min. & 260 mW min. – 450 nm
  - 180 mW min. & 240 mW min. – 460 nm
  - 160 mW min. & 220 mW min. – 470 nm
- Lambertian Radiation
- Conductive Epoxy, Solder Paste or Preforms, or Flux Eutectic Attach
- Thin 100 µm Chip
- Low Forward Voltage – 3.6 V Typical at 350 mA
- Single Wire Bond Structure
- 1000 V ESD Threshold Rating

APPLICATIONS

- General Illumination
  - Aircraft
  - Decorative Lighting
  - Task Lighting
  - Outdoor Illumination
- White LEDs
- Crosswalk Signals
- Backlighting
- Automotive

CxxxEZ700-Sxx000 Chip Diagram



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Maximum Ratings at T_A = 25°C [Note 1]	CxxxEZ700-Sxx000
DC Forward Current	500 mA
Peak Forward Current	1000 mA [Note 4]
LED Junction Temperature	125°C
Reverse Voltage	5 V
Operating Temperature Range	-40°C to +100°C
Storage Temperature Range	-40°C to +120°C
Electrostatic Discharge Threshold Rating (HBM) [Note 2]	1000 V

Typical Electrical/Optical Characteristics at T_A = 25°C, If = 350 mA [Note 3]

Part Number	Forward Voltage (V_f, V)			Reverse Current [I(Vr=5 V), µA]	Full Width Half Max (λ_D, nm)
	Min.	Typ.	Max.	Max.	Typ.
C450EZ700-S*xx*000	3.0	3.6	3.9	2	21
C460EZ700-S*xx*000	3.0	3.6	3.9	2	21
C470EZ700-S*xx*000	3.0	3.6	3.9	2	22

Mechanical Specifications — **C*xxx*EZ700-S*xx*000**

Description	Dimension	Tolerance
P-N Junction Area (µm)	650 x 650	±25
Chip Area (µm)	680 x 680	±25
Chip Thickness (µm)	100	±25
Top Au Bond Pad (µm)	130 x 130	±15
Au Bond Pad Thickness (µm)	3.0	±1.0
Back Contact Metal Area (µm)	680 x 680	±25
Back Contact Metal Thickness (µm)	3.0	±1.0

Notes:

1. Maximum ratings are package-dependent. The above ratings were determined using a Au-plated TO39 header without an encapsulant for characterization. Ratings for other packages may differ. The junction temperature should be characterized in a specific package to determine limitations. Assembly processing temperature must not exceed 325°C (< 5 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 minimum ESD ratings shown.
3. All products conform to the listed minimum and maximum specifications for electrical and optical characteristics when assembled and operated at 350 mA within the maximum ratings shown above. Efficiency decreases at higher currents. Typical values given are within the range of average expected by the manufacturer in large quantities and are provided for information only. All measurements were made using a Au-plated TO39 header without an encapsulant. Optical characteristics measured in an integrating sphere using Illuminance E.
4. This peak forward current specification is based on a 400 ms pulse width at a 1/5-duty cycle with a junction temperature of 65°C.

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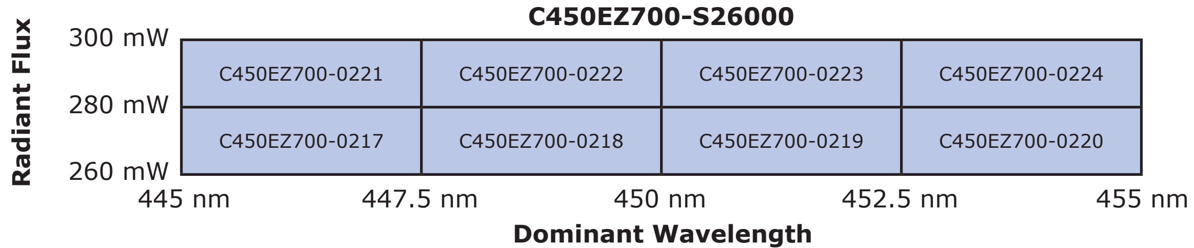
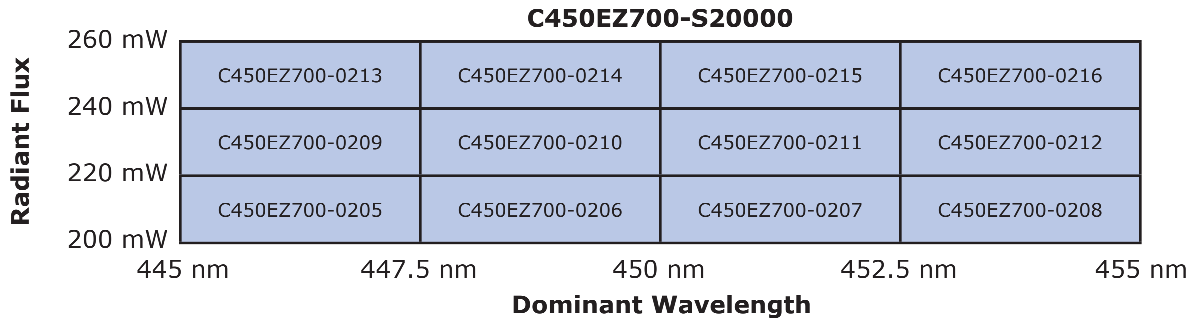
Standard Bins for C*xxx*EZ700-S*xx*000

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 (C*xxx*EZ700-S*xx*000) orders may be filled with any or all bins (C*xxx*EZ700-0*xxx*) contained in the kit. All radiant flux and all dominant wavelength values shown and specified are at If = 350 mA. Radiant flux values are measured using Au-plated TO39 headers without an encapsulant.





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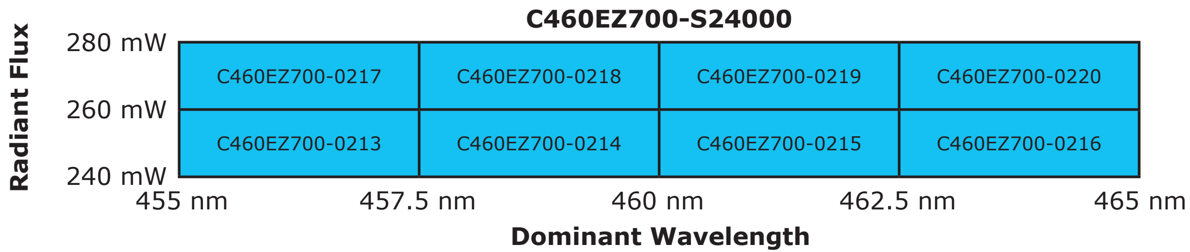
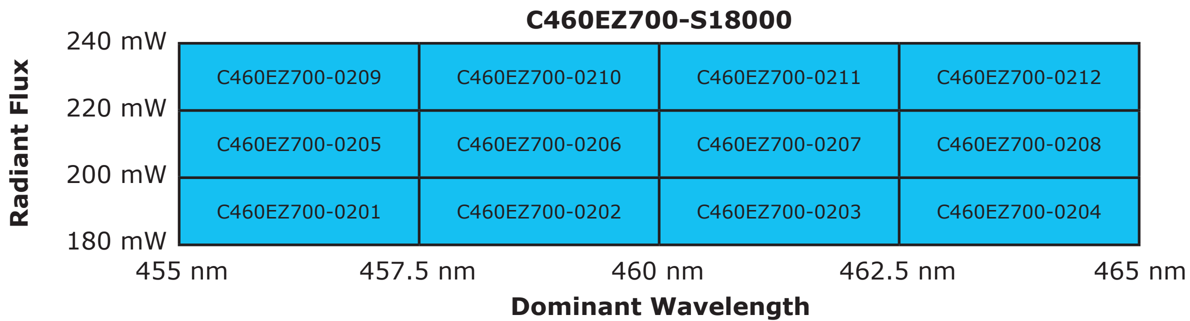
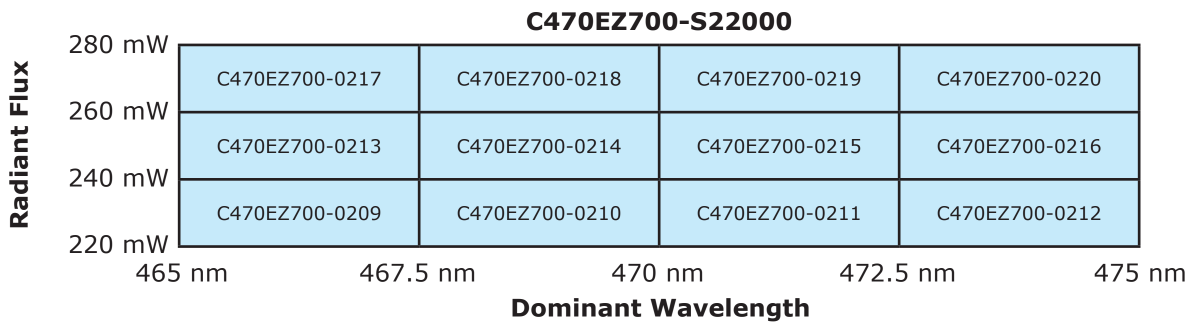
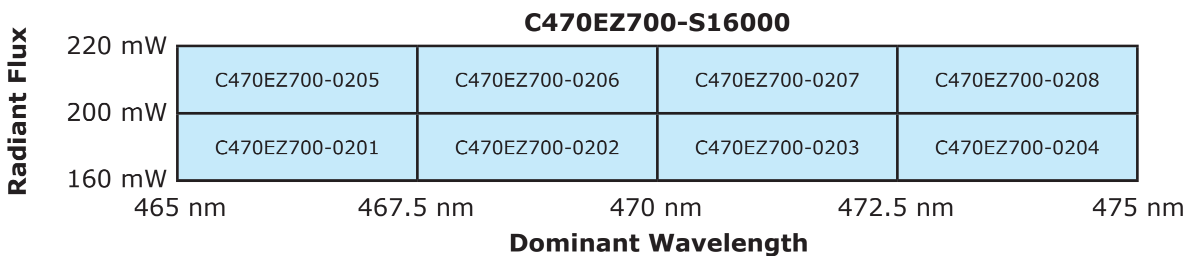
Standard Bins for C*xxx*EZ700-S*xx*000 (continued)









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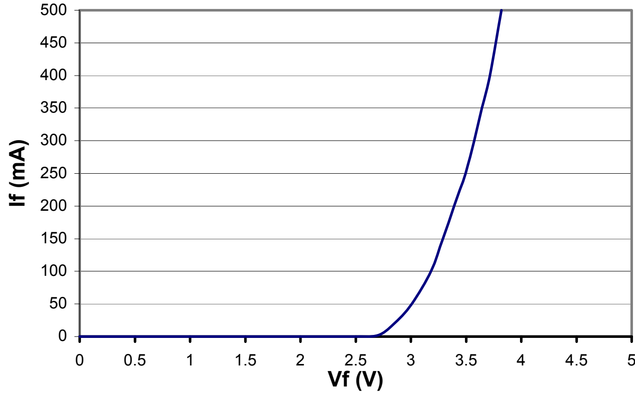
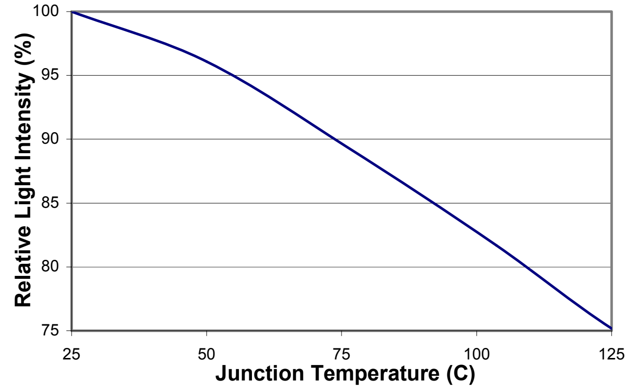
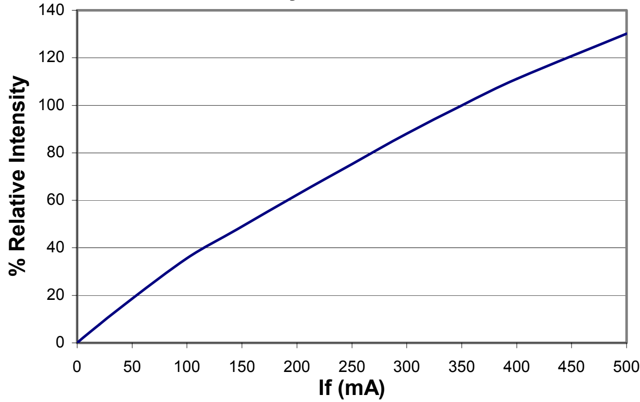
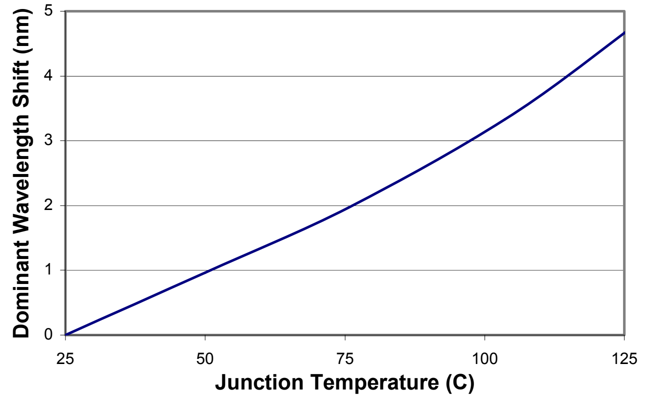
Characteristic Curves

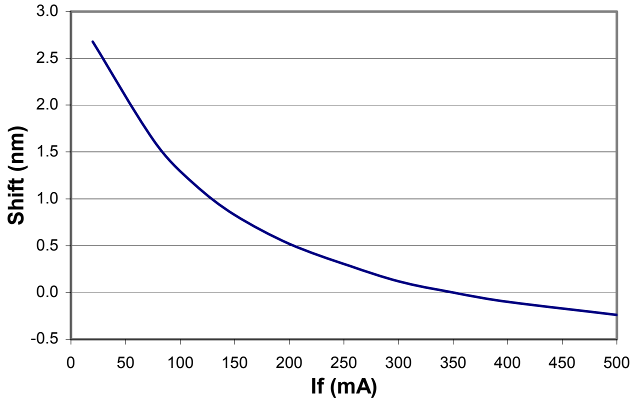
These are representative measurements for the EZBright Power Chip LED product. Actual curves will vary slightly for the various radiant flux and dominant wavelength bins.

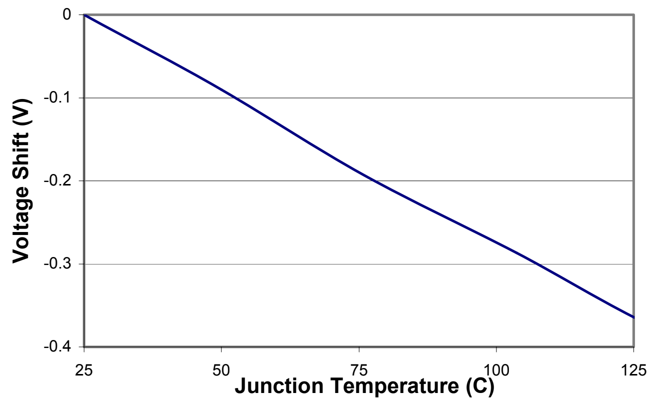












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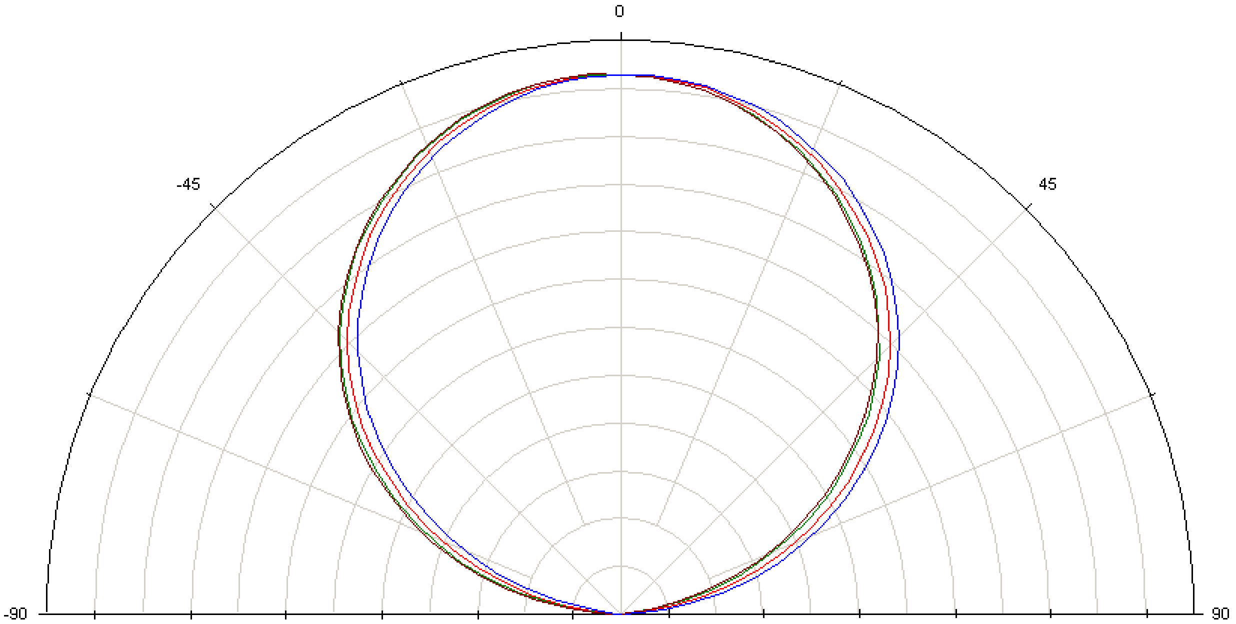
CREE LED Light

Radiation Pattern

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



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