Cree® EZ1000™ Gen 2 LEDs
Data Sheet (Cathode-up)
C*xxx*EZ1000-S*xx*000-2

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 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, solder paste or solder preforms, as well as the flux eutectic method. These vertically structured, low forward voltage LED chips are approximately 170 microns in height. Cree's EZ™ chips are tested for conformity to optical and electrical specifications. These LEDs are useful in a broad range of applications such as general illumination, automotive lighting, and LCD backlighting.

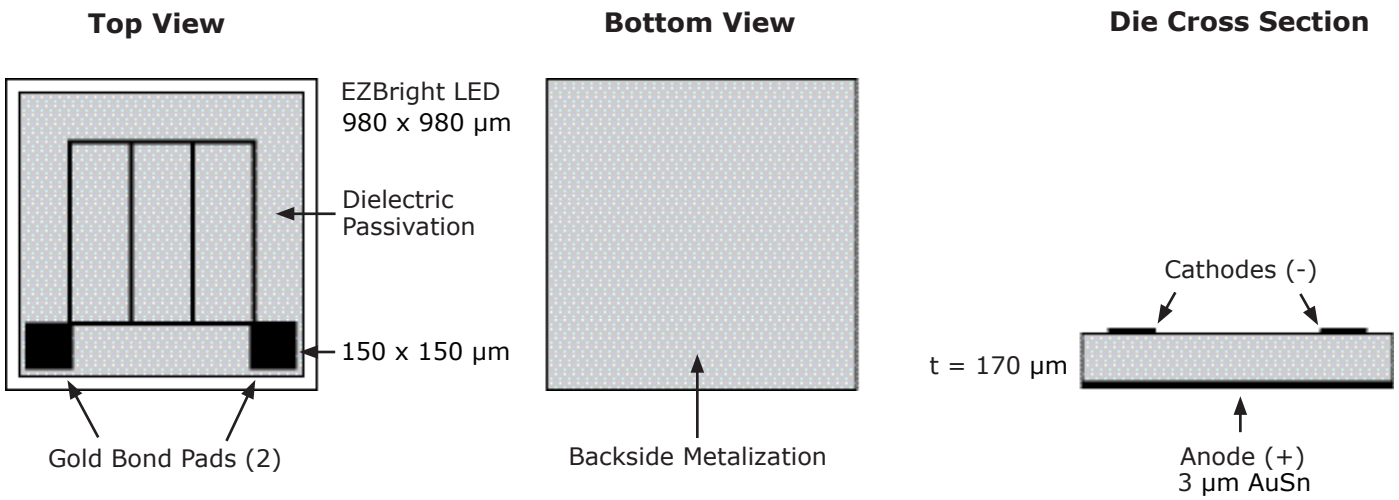
FEATURES

- EZBright LED Technology
  - » 380 mW min. – 450 nm
  - » 360 mW min. – 460 nm
  - » 110 mW min. – 527 nm
- Lambertian Radiation
- Conductive Epoxy, Solder Paste or Preforms, or Flux Eutectic Attach
- Low Forward Voltage
- Dielectric Passivation across Epi Surface

APPLICATIONS

- General Illumination
  - » Aircraft
  - » Decorative Lighting
  - » Task Lighting
  - » Outdoor Illumination
- White LEDs
- LCD Backlighting
- Projection Displays
- Automotive

C*xxx*EZ1000-S*xx*000-2 Chip Diagram



Maximum Ratings at T_A = 25°C Note 1, 2 & 3	CxxxEZ1000-Sxx000-2
DC Forward Current	1000 mA
Peak Forward Current (1/10 duty cycle @ 1 kHz)	1250 mA
LED Junction Temperature	150°C
Reverse Voltage	5 V
Operating Temperature Range	-40°C to +100°C
LED Chip Storage Temperature	-40°C to +120°C
Recommended Die Sheet Storage Conditions	≤30°C / ≤85% RH

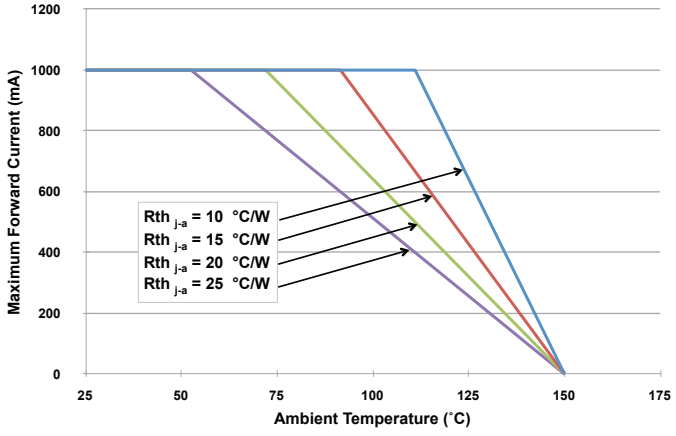
Typical Electrical/Optical Characteristics at T_A = 25°C, If = 350 mA Note 2

Part Number	Forward Voltage (V_f, V)			Reverse Current [I(Vr=5V), µA]	Full Width Half Max (λ_D, nm)
	Min.	Typ.	Max.	Max.	Typ.
C450EZ1000-Sxx000-2	2.9	3.2	3.8	2	20
C460EZ1000-Sxx000-2	2.9	3.2	3.8	2	21
C527EZ1000-Sxx000-2	3.0	3.4	4.0	2	35

Mechanical Specifications	CxxxEZ1000-Sxx000-2	
Description	Dimensions	Tolerance
P-N Junction Area (µm)	950 x 950	± 35
Chip Area (µm)	980 x 980	± 35
Chip Thickness (µm)	170	± 25
Top Au Bond Pad (µm) - Qty. 2	150 x 150	± 25
Au Bond Pad Thickness (µm)	3.0	± 1.5
Back Contact Metal Area (µm)	980 x 980	± 35
Back Contact Metal Thickness (µm)	3.0	± 1.5

Notes:

1. Maximum ratings are package-dependent. The above ratings were determined using a 3.45 x 3.45 mm SMT package 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. 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 values 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 were measured in an integrating sphere using Illuminance E.
3. The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end-product to be designed in a manner that minimizes the thermal resistance from the LED junction to ambient in order to optimize product performance.



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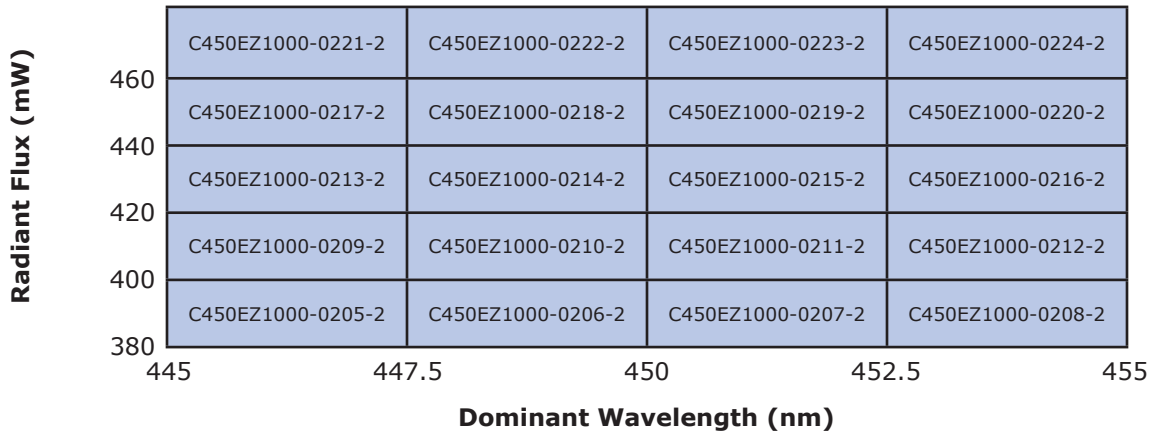
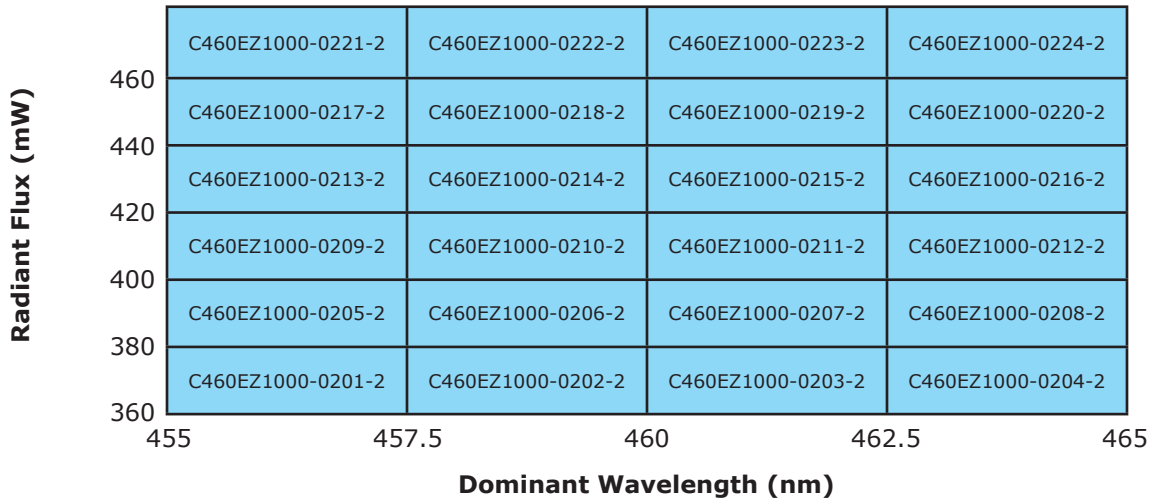
Standard Bins for C*xxx*EZ1000-S*xx*000-2

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*EZ1000-S*xx*000-2) orders may be filled with any or all bins (C*xxx*EZ1000-0*xxx*-2) contained in the kit. All radiant flux and dominant wavelength values shown and specified are at If = 350 mA. Radiant flux values are measured using Au-plated TO39 headers without an encapsulant.

C450EZ1000-S38000-2



C460EZ1000-S36000-2



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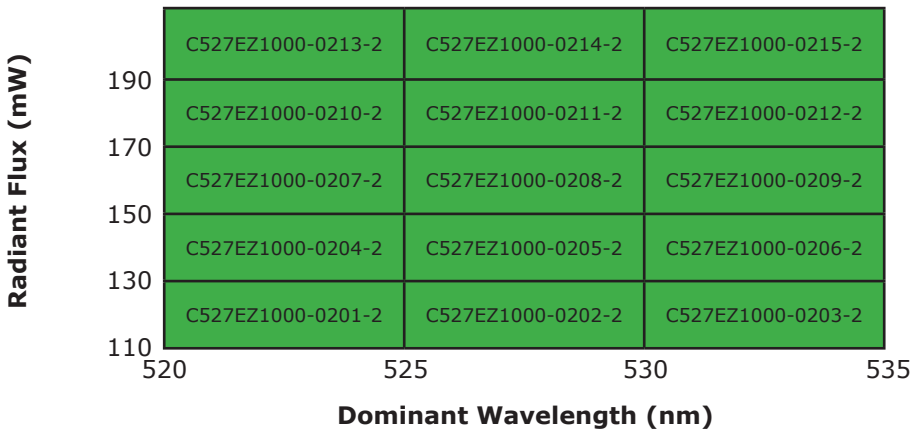

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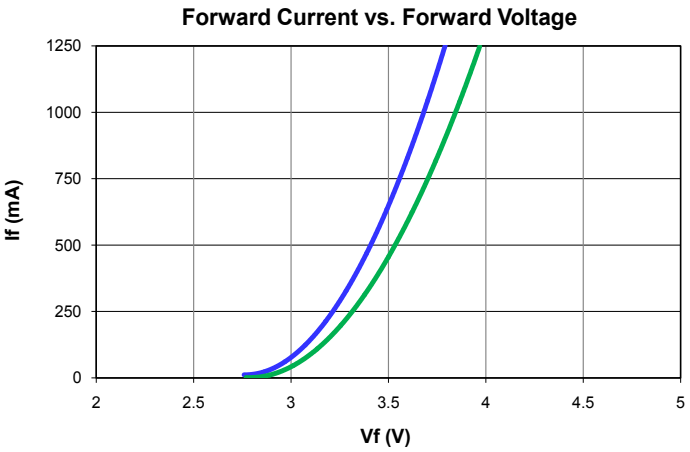
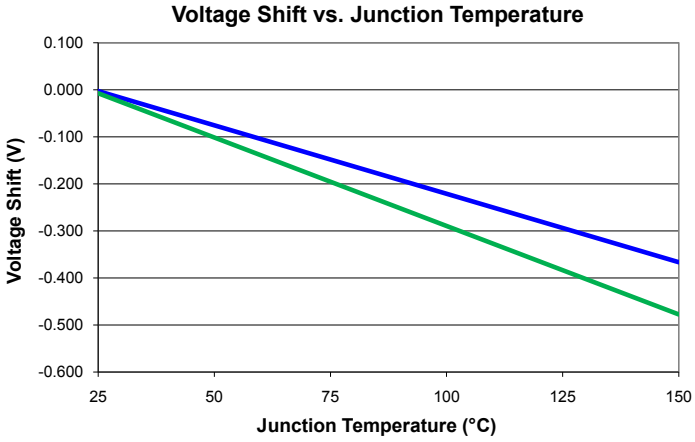
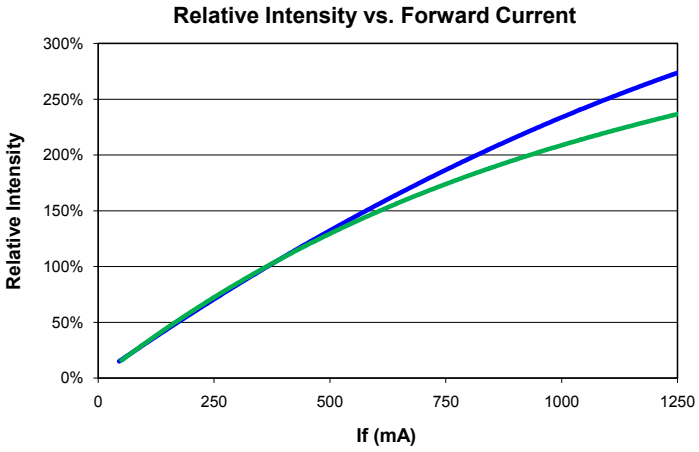
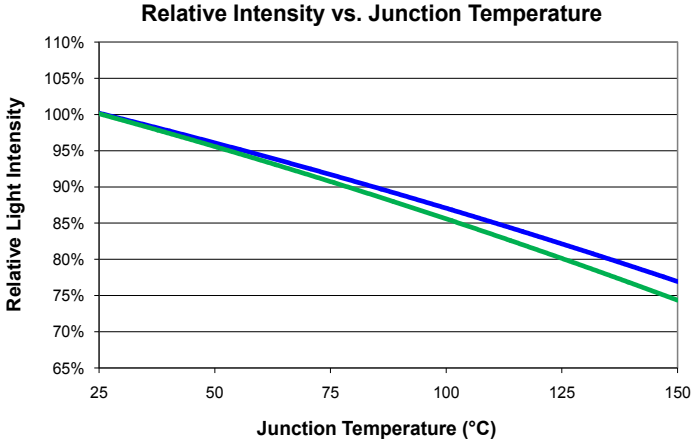
Characteristic Curves

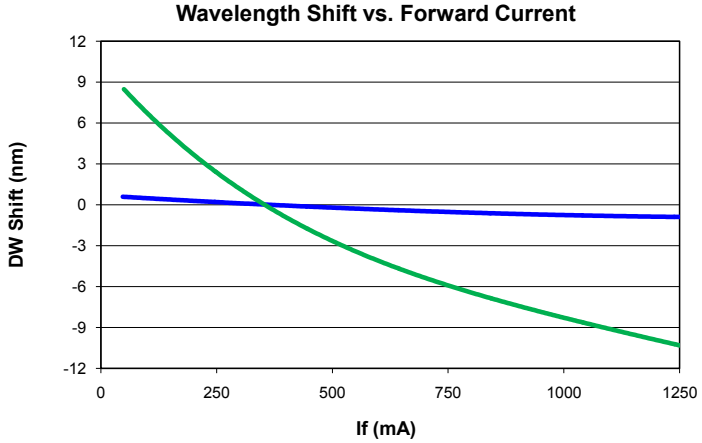
These are representative measurements for the EZBright 1000. Actual curves will vary slightly for the various radiant flux and dominant wavelength bins.

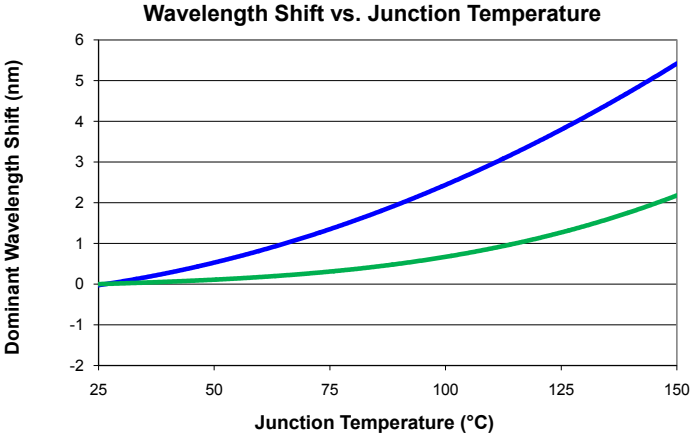












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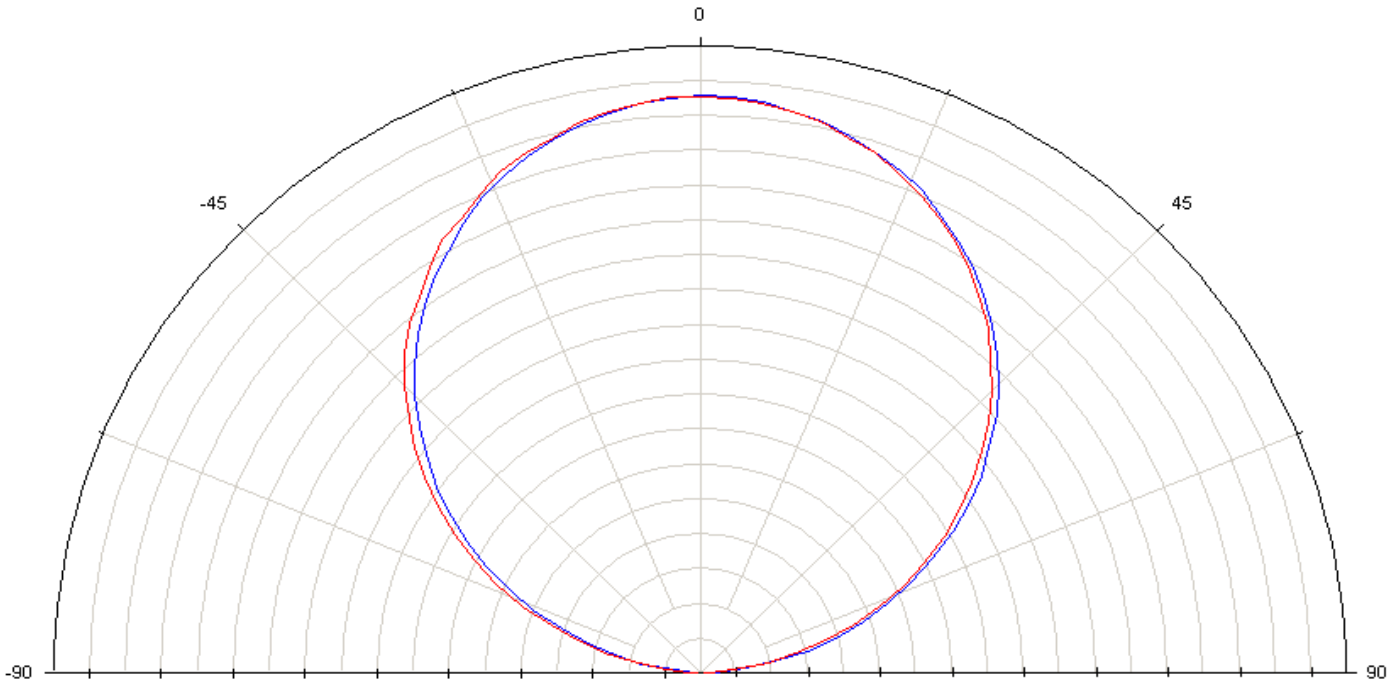
Radiation Pattern

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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