

Cree® EZ600™ LED

Data Sheet

CxxxEZ600-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, as well as 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. These LEDs are useful in a broad range of applications, such as general illumination, automotive lighting and LCD backlighting.

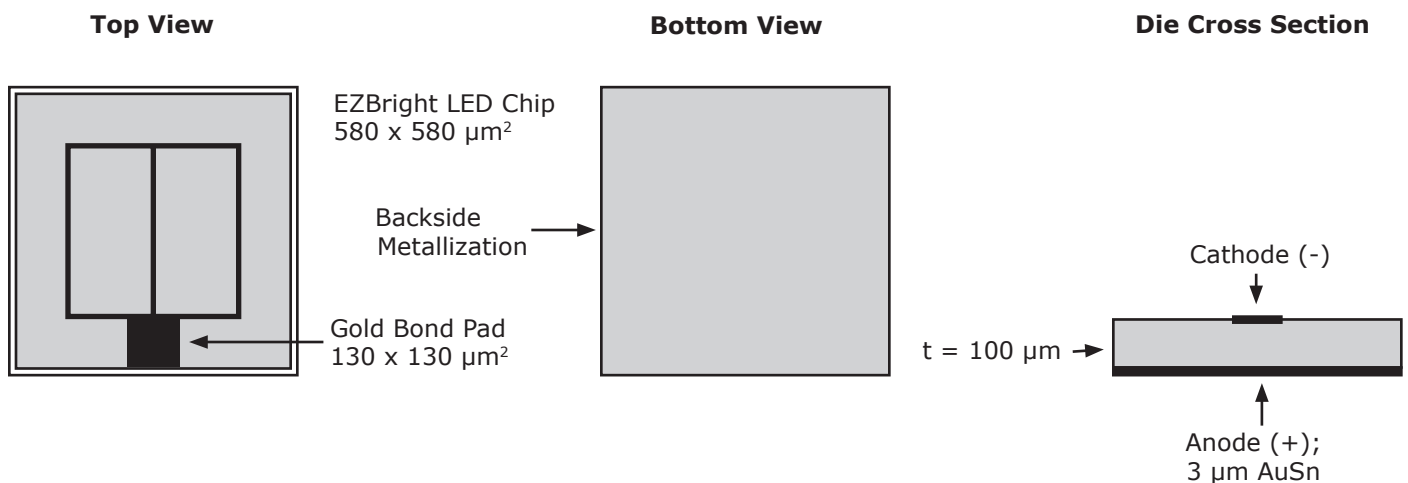
FEATURES

- EZBright Power Chip LED Rf Performance
 - 140 mW min. & 200 mW min. – 450, 460 & 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
- Maximum DC Forward Current - 400 mA

APPLICATIONS

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

CxxxEZ600-Sxx000 Chip Diagram



Maximum Ratings at $T_A = 25^\circ\text{C}$ ^{Note 1}		CxxxEZ600-Sxx000
DC Forward Current		400 mA
Peak Forward Current		750 mA ^{Note 3}
LED Junction Temperature		145°C
Reverse Voltage		5 V
Operating Temperature Range		-40°C to +100°C
Storage Temperature Range		-40°C to +120°C

Typical Electrical/Optical Characteristics at $T_A = 25^\circ\text{C}$, $I_f = 350\text{ mA}$ ^{Note 2}					
Part Number	Forward Voltage (V_f , V)			Reverse Current [$I(V_r=5\text{ V})$, μA]	Full Width Half Max (λ_D , nm)
	Min.	Typ.	Max.	Max.	Typ.
C450EZ600-Sxx000	3.1	3.6	4.1	2	21
C460EZ600-Sxx000	3.1	3.6	4.1	2	21
C470EZ600-Sxx000	3.1	3.6	4.1	2	22

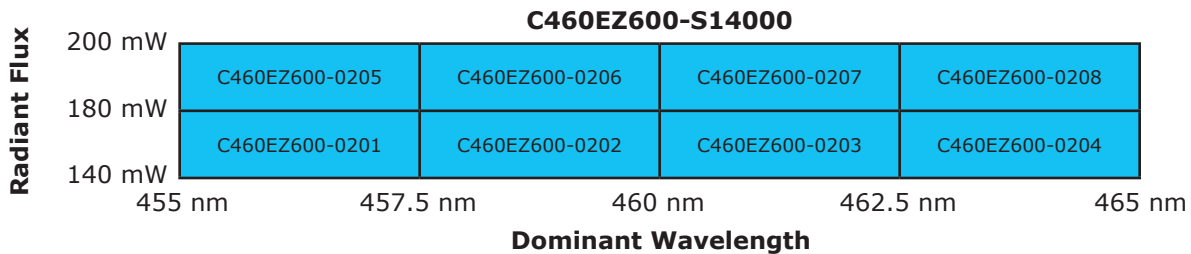
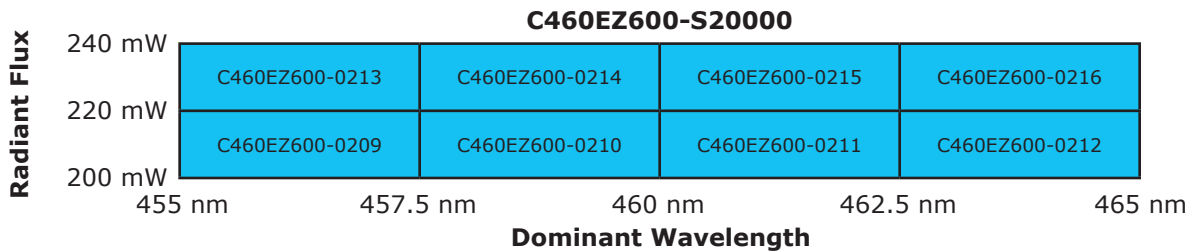
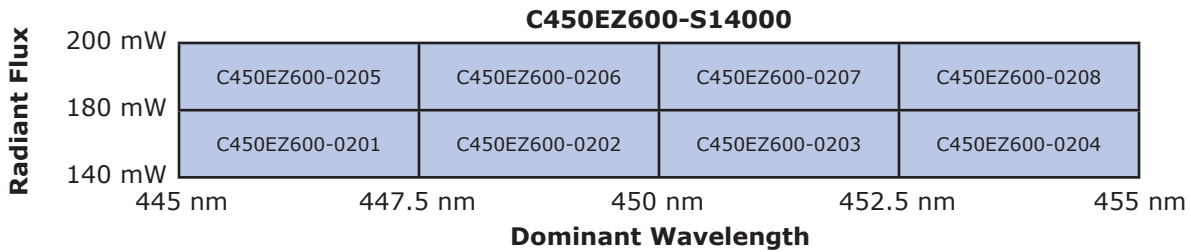
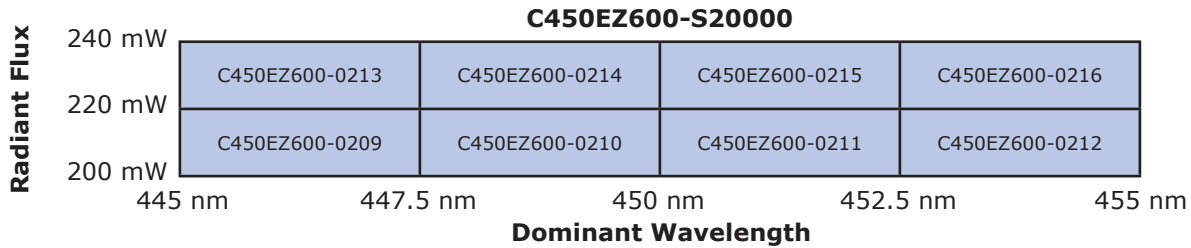
Mechanical Specifications		CxxxEZ600-Sxx000	
Description	Dimension	Tolerance	
P-N Junction Area (μm)	550 x 550	± 40	
Chip Area (μm)	580 x 580	± 40	
Chip Thickness (μm)	100	± 25	
Top Au Bond Pad (μm)	130 x 130	± 15	
Au Bond Pad Thickness (μm)	3.0	± 1.0	
Back Contact Metal Area (μm)	580 x 580	± 40	
Back Contact Metal Thickness (μm)	3.0	± 1.0	

Notes:

- 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.
- 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.
- 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.

Standard Bins for CxxxEZ600-Sxx000

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 (CxxxEZ600-Sxx000) orders may be filled with any or all bins (CxxxEZ600-0xxx) contained in the kit. All radiant flux and all dominant wavelength values shown and specified are at $I_f = 350$ mA. Radiant flux values are measured using Au-plated TO39 headers without an encapsulant.



Standard Bins for CxxxEZ600-Sxx000 (continued)

C470EZ600-S20000

Radiant Flux	240 mW	C470EZ600-0213	C470EZ600-0214	C470EZ600-0215	C470EZ600-0216	
	220 mW	C470EZ600-0209	C470EZ600-0210	C470EZ600-0211	C470EZ600-0212	
	200 mW	465 nm	467.5 nm	470 nm	472.5 nm	475 nm

Dominant Wavelength

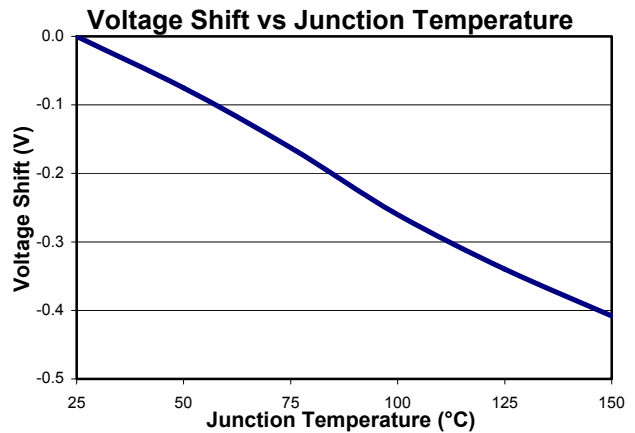
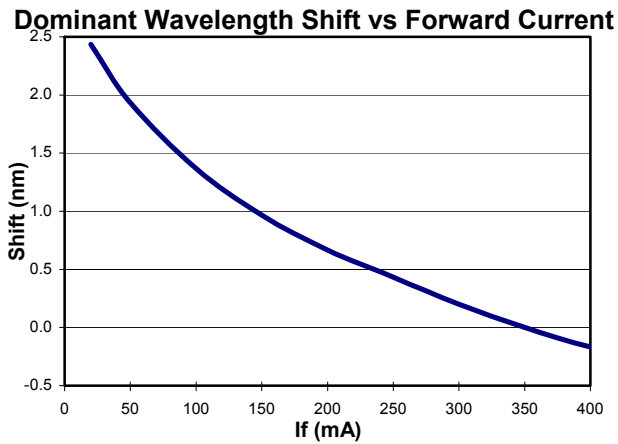
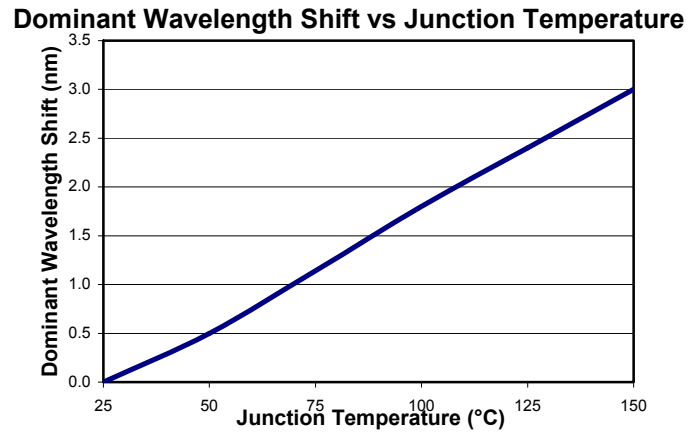
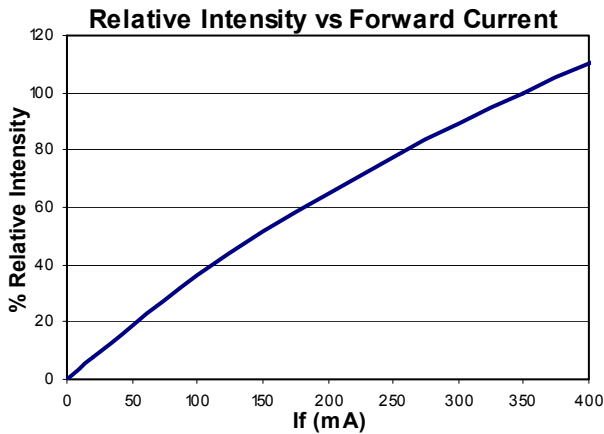
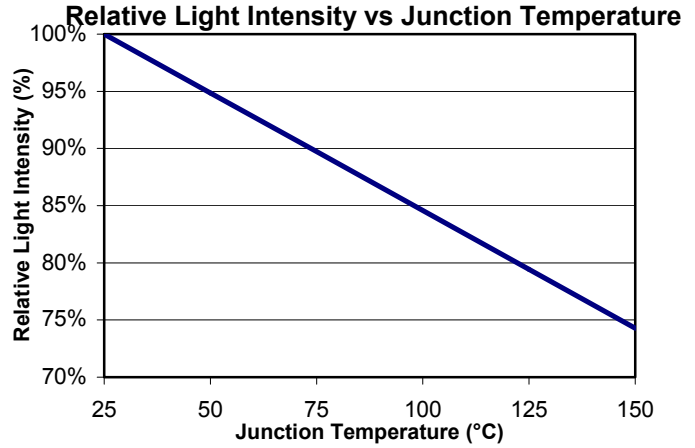
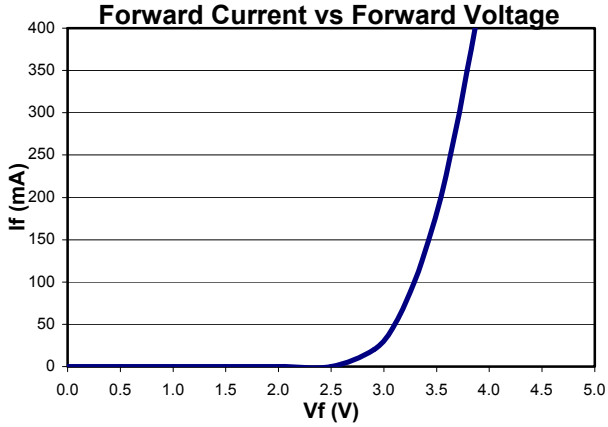
C470EZ600-S14000

Radiant Flux	200 mW	C470EZ600-0205	C470EZ600-0206	C470EZ600-0207	C470EZ600-0208	
	180 mW	C470EZ600-0201	C470EZ600-0202	C470EZ600-0203	C470EZ600-0204	
	140 mW	465 nm	467.5 nm	470 nm	472.5 nm	475 nm

Dominant Wavelength

Characteristic Curves

These are representative measurements for the EZ600 LED product. Actual curves will vary slightly for the various radiant flux and dominant wavelength bins.



Radiation Pattern

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

