

Cree® EZ700™ Gen II LED

Data Sheet

CxxxEZ700-Sxx000-2

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 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 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.

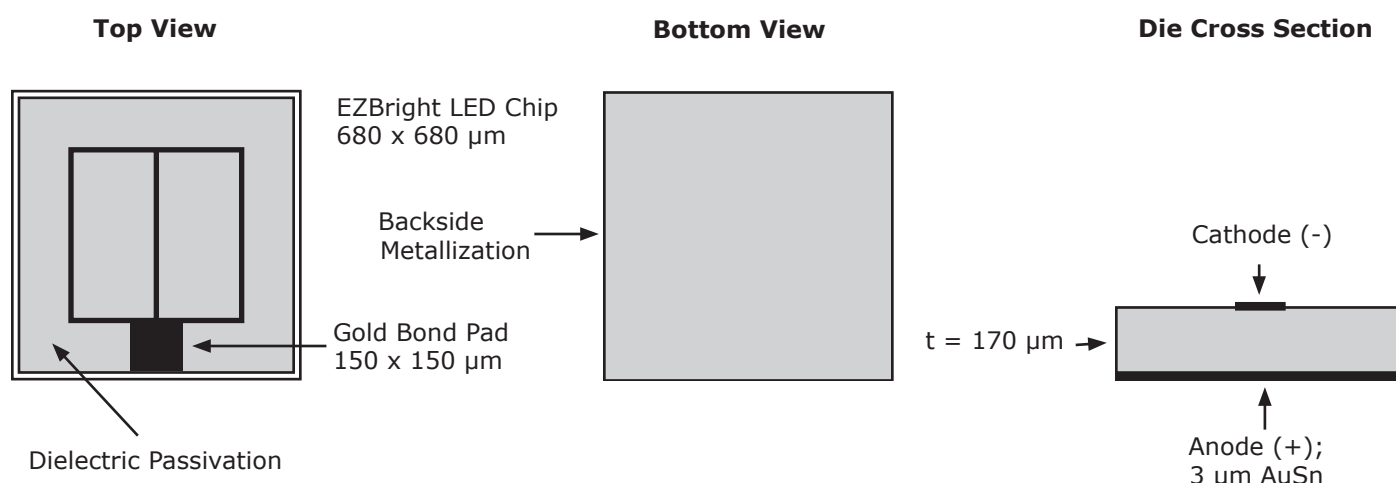
FEATURES

- EZBright Power Chip LED Rf Performance
 - 240 mW min. - 450 & 460 nm
 - 200 mW min. - 470 nm
 - 90 mW min. - 527 nm
- Lambertian Radiation
- Conductive Epoxy, Solder Paste or Preforms, or Flux Eutectic Attach
- Low Forward Voltage – 3.6 V Typical at 350 mA
- Single Wire Bond Structure
- Dielectric Passivation Across Epi Surface

APPLICATIONS

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

CxxxEZ700-Sxx000-2 Chip Diagram





Maximum Ratings at $T_A = 25^{\circ}\text{C}$ Note 1		CxxxEZ700-Sxx000-2
DC Forward Current		750 mA
Peak Forward Current		1000 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.
C450EZ700-Sxx000-2	3.0	3.5	3.9	2	20
C460EZ700-Sxx000-2	3.0	3.5	3.9	2	21
C470EZ700-Sxx000-2	3.0	3.5	3.9	2	22
C527EZ700-Sxx000-2	3.1	3.5	4.0	2	35

Mechanical Specifications			CxxxEZ700-Sxx000-2
Description		Dimension	Tolerance
P-N Junction Area (μm)		650 x 650	± 35
Chip Area (μm)		680 x 680	± 35
Chip Thickness (μm)		170	± 25
Top Au Bond Pad (μm)		150 x 150	± 25
Au Bond Pad Thickness (μm)		3.0	± 1.5
Back Contact Metal Area (μm)		680 x 680	± 35
Back Contact Metal Thickness (μm)		3.0	± 1.5

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. 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.
3. 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 CxxxEZ700-Sxx000-2

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 (CxxxEZ700-Sxx000-2) orders may be filled with any or all bins (CxxxEZ700-0xxx-2) 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.

C450EZ700-S24000-2

Radiant Flux	C450EZ700-0313-2	C450EZ700-0314-2	C450EZ700-0315-2	C450EZ700-0316-2
	C450EZ700-0309-2	C450EZ700-0310-2	C450EZ700-0311-2	C450EZ700-0312-2
	C450EZ700-0305-2	C450EZ700-0306-2	C450EZ700-0307-2	C450EZ700-0308-2
	310 mW	280 mW	240 mW	
	445 nm	447.5 nm	450 nm	452.5 nm
	Dominant Wavelength			

C460EZ700-S24000-2

Radiant Flux	C460EZ700-0313-2	C460EZ700-0314-2	C460EZ700-0315-2	C460EZ700-0316-2
	C460EZ700-0309-2	C460EZ700-0310-2	C460EZ700-0311-2	C460EZ700-0312-2
	C460EZ700-0305-2	C460EZ700-0306-2	C460EZ700-0307-2	C460EZ700-0308-2
	310 mW	280 mW	240 mW	
	455 nm	457.5 nm	460 nm	462.5 nm
	Dominant Wavelength			

C470EZ700-S20000-2

Radiant Flux	C470EZ700-0309-2	C470EZ700-0310-2	C470EZ700-0311-2	C470EZ700-0312-2
	C470EZ700-0305-2	C470EZ700-0306-2	C470EZ700-0307-2	C470EZ700-0308-2
	C470EZ700-0301-2	C470EZ700-0302-2	C470EZ700-0303-2	C470EZ700-0304-2
	280 mW	240 mW	200 mW	
	465 nm	467.5 nm	470 nm	472.5 nm
	Dominant Wavelength			

C527EZ700-Sxx00-2

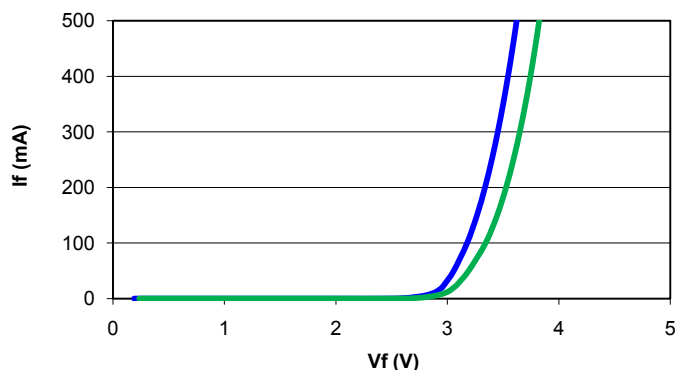
Radiant Flux	C527EZ700-0210-2	C527EZ700-0211-2	C527EZ700-0212-2
	C527EZ700-0207-2	C527EZ700-0208-2	C527EZ700-0209-2
	C527EZ700-0204-2	C527EZ700-0205-2	C527EZ700-0206-2
	C527EZ700-0201-2	C527EZ700-0202-2	C527EZ700-0203-2
	150 mW	130 mW	110 mW
	90 mW		
	520 nm	525 nm	530 nm
	Dominant Wavelength		



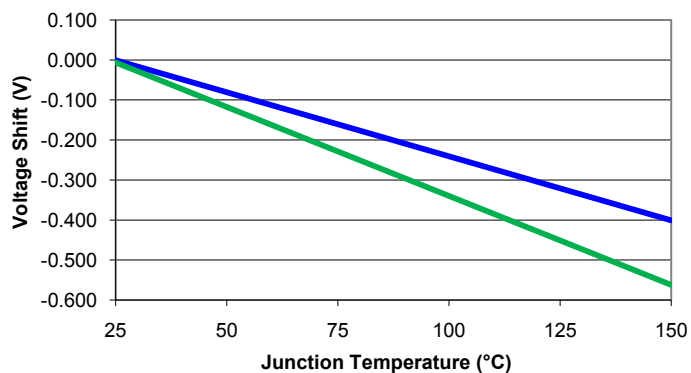
Characteristic Curves

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.

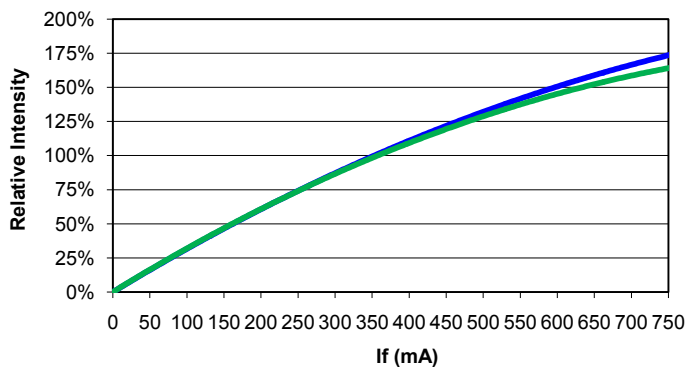
Forward Current vs. Forward Voltage



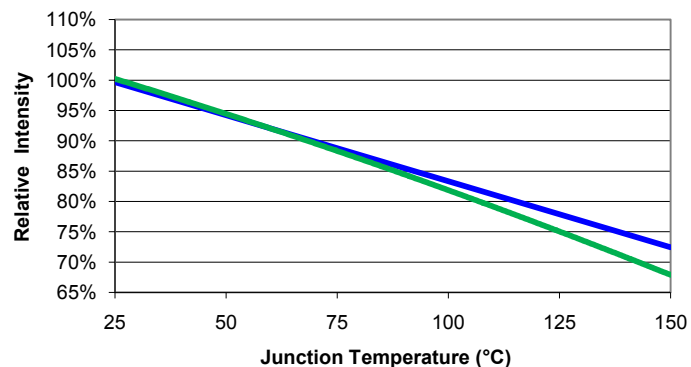
Voltage Shift vs. Junction Temperature



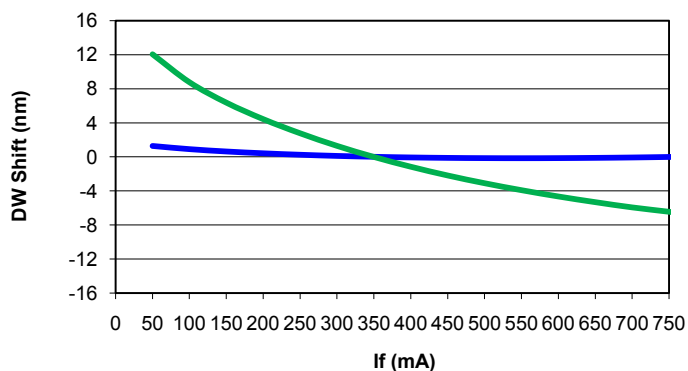
Relative Intensity vs. Forward Current



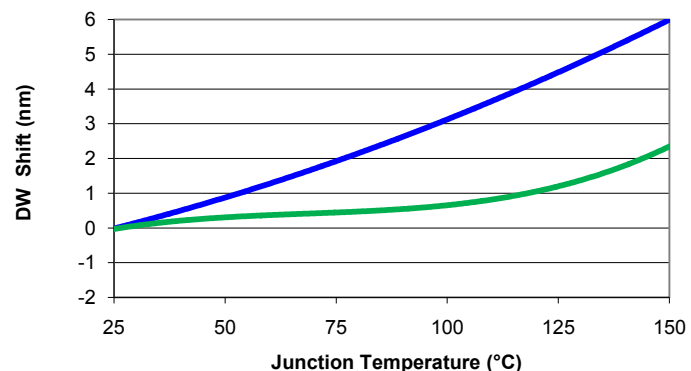
Relative Light Intensity vs. Junction Temperature



Wavelength Shift vs. Forward Current



Dominant Wavelength Shift vs. Junction Temperature





Radiation Pattern

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

