

## Features

- High Performance
  - 1.0 - 4.0mW (460nm) Deep Blue
  - 1.0 – 3.8mW (470nm) Blue
  - 0.5 – 1.8mW (527nm) Green
- Sorted to Wavelength and Power Bins
- Single Wire Bond Structure
- Class II ESD Rating

## Applications

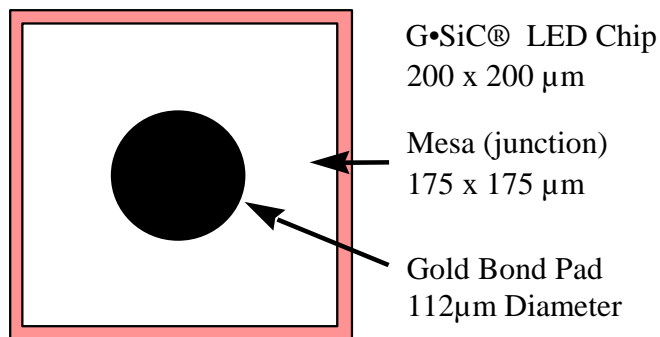
- Outdoor LED Video Displays
- White LEDs
- Automotive Dashboard Lighting
- Cellular Phone Backlighting
- Audio Product Display Lighting
- Entertainment and Amusement

## Description

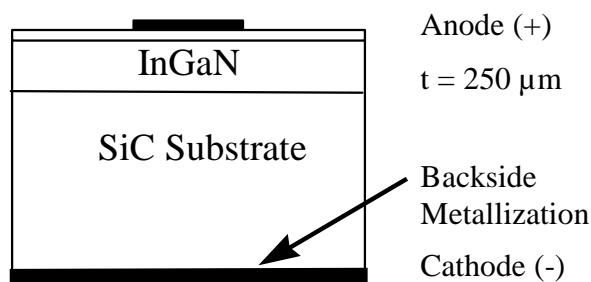
Cree's CB™ series of SuperBright™ LEDs combine highly efficient InGaN materials with Cree's proprietary G•SiC® substrate to deliver excellent price performance for high intensity blue and green LEDs. These LED chips have an industry-standard vertical chip structure, which requires only a single wire bond connection. Sorted Die Kits provide die sheets conveniently sorted into wavelength and radiant flux bins. Cree's CB series chips are tested for conformity to optical and electrical specifications and the ability to withstand 1000V ESD. These LEDs are useful in a broad range of applications such as outdoor and indoor full motion LED video signs, transportation signaling and white LEDs, yet can also be used in high volume applications such as LCD backlighting. Cree's CB series chips are compatible with most radial and SMT LED assembly processes.

## Cxxx-CB230-S0100 Chip Diagram

**Topside View**



**Die Cross Section**





**G•SiC® Technology**  
**SuperBright™ LEDs**  
**Cxxx-CB230-S0100**

**Maximum Ratings at  $T_A = 25^\circ\text{C}$**  <sup>Notes 1&3</sup>

<b>Cxxx-CB230-S0100</b>	
DC Forward Current	15 mA
Peak Forward Current (1/10 duty cycle @ 1kHz)	35 mA
LED Junction Temperature	125°C
Reverse Voltage	5 V
Operating Temperature Range	-20°C to +80°C
Storage Temperature Range	-30°C to +100°C
Electrostatic Discharge Threshold (HBM) <sup>Note 2</sup>	1000 V
Electrostatic Discharge Classification (MIL-STD-883E) <sup>Note 2</sup>	Class 2

**Typical Electrical/Optical Characteristics at  $T_A = 25^\circ\text{C}$ ,  $I_f = 10\text{mA}$**  <sup>Note 3</sup>

Part Number	Forward Voltage ( $V_f$ , V)		Reverse Current [I( $V_r=5\text{V}$ ), $\mu\text{A}$ ]	Peak Wavelength ( $\lambda_p$ , nm)	Halfwidth ( $\lambda_D$ , nm)	Optical Rise Time ( $\tau$ , ns)
	Typ	Max	Max	Typ	Typ	Typ
C460CB230-S0100	3.3	3.7	10	458	26	30
C470CB230-S0100	3.3	3.7	10	468	26	30
C527CB230-S0100	3.3	3.7	10	523	36	30

**Mechanical Specifications**

<b>Cxxx-CB230-S0100</b>		
Description	Dimension	Tolerance
P-N Junction Area ( $\mu\text{m}$ )	175 x 175	$\pm 25$
Top Area ( $\mu\text{m}$ )	200 x 200	$\pm 25$
Bottom Area ( $\mu\text{m}$ )	200 x 200	$\pm 25$
Chip Thickness ( $\mu\text{m}$ )	250	$\pm 25$
Au Bond Pad Diameter ( $\mu\text{m}$ )	112	$\pm 20$
Au Bond Pad Thickness ( $\mu\text{m}$ )	1.2	$\pm 0.5$
Back Contact Metal Width ( $\mu\text{m}$ )	19.8	-5,+10

**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 325°C (<5 seconds).

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 II 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 10 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 lamps in T-1 3/4 packages (with Hysol OS4000 epoxy). Dominant wavelength measurements taken using Illuminance E.

4) Specifications are subject to change without notice.



**G•SiC<sup>®</sup> Technology**  
**SuperBright™ LEDs**  
**Cxxx-CB230-S0100**

## Standard Bins:

LED chips are sorted to the **radiant flux** and **dominant wavelength** bins. A sorted die sheet contains die from only one bin. Sorted die kit (Cxxx-CB230-S0100) orders may be filled with any or all bins (Cxxx-CB230-01xx) contained in the kit.

### Kit Part Number

4.0mW	C460CB230-0105	C460CB230-0106
3.0mW	C460CB230-0103	C460CB230-0104
2.0mW	C460CB230-0101	C460CB230-0102
1.0mW		
	455nm	460nm

**C460CB230-S0100**

3.8mW	C470CB230-0105	C470CB230-0106
2.7mW	C470CB230-0103	C470CB230-0104
1.7mW	C470CB230-0101	C470CB230-0102
1.0mW		
	465nm	470nm

**C470CB230-S0100**

1.8mW	C527CB230-0104	C527CB230-0105	C527CB230-0106
0.9mW	C527CB230-0101	C527CB230-0102	C527CB230-0103
0.5mW			
	520nm	525nm	530nm

**C527CB230-S0100**