

## Features

- High Performance
  - 2.0mW (460nm) Deep Blue
  - 2.0mW (470nm) Blue
  - 1.5mW (505nm) Signal Green
  - 1.0mW (527nm) Green
- Sorted to Wavelength and Power Bins
- Single Wire Bond Structure
- Class II ESD Rating

## Applications

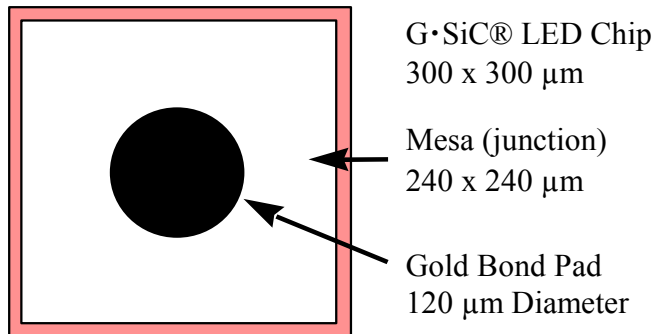
- Outdoor LED Video Displays
- White LEDs
- Automotive Dashboard Lighting
- Cellular Phone Backlighting
- Audio Product Display Lighting
- Entertainment and Amusement

## Description

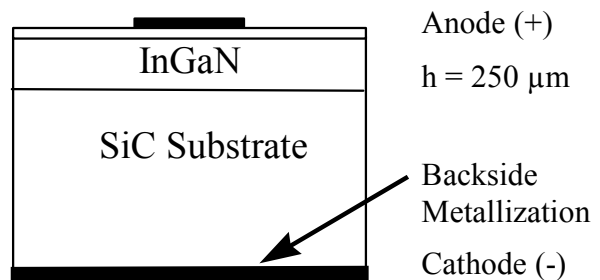
Cree's CB™ series of SuperBright™ LEDs combine highly efficient InGaN materials with Cree's proprietary SiC substrate to deliver excellent price performance for high intensity blue and green LEDs. These LED chips have an industry-standard vertical chip structure, which requires only a single wire bond connection. Sorted Die Kits provide die sheets conveniently sorted into wavelength and radiant flux bins. Cree's CB series chips are individually 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-CB290-S0100 Chip Diagram

**Topside View**



**Die Cross Section**



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

<b>CXXX-CB290-S0100</b>	
DC Forward Current	30 mA
Peak Forward Current (1/10 duty cycle @ 1kHz)	100 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  $T_A = 25^\circ\text{C}$ ,  $I_f = 20\text{mA}$**  <sup>Note 3</sup>

Part Number	Forward Voltage (V <sub>f</sub> , V)		Reverse Current [I(V <sub>r</sub> =5V), μA]	Peak Wavelength (λ <sub>p</sub> , nm)	Halfwidth (λ <sub>D</sub> , nm)	Optical Rise Time (τ, ns)
	Typ	Max	Max	Typ	Typ	Typ
C460CB290-S0100	3.3	3.7	10	458	26	30
C470CB290-S0100	3.3	3.7	10	468	26	30
C505CB290-S0100	3.3	3.7	10	502	30	30
C525CB290-S0100	3.3	3.7	10	523	36	30

**Mechanical Specifications**

<b>CXXX-CB290-S0100</b>		
Description	Dimension	Tolerance
P-N Junction Area (μm)	240 x 240	± 25
Bottom Area (μm)	300 x 300	± 25
Chip Thickness (μm)	250	± 25
Au Bond Pad Diameter (μm)	120	± 20
Au Bond Pad Thickness (μm)	1.2	± 0.5
Back Contact Metal Width (μm)	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 350°C (< 15 minutes).

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 20 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). Optical characteristics were measured in a Photoresearch Spectrascan Integrating Sphere. Illuminance E.

4) Specifications are subject to change without notice.

## Standard Bins:

All LED chips are sorted onto die sheets according to the bins shown below.

8.0mW	460CB290-0105	460CB290-0106
6.0mW	460CB290-0103	460CB290-0104
4.0mW	460CB290-0101	460CB290-0102
2.0mW		
	455nm	460nm

**C460CB290-S0100**

Sorted Die Kits may contain any or all bins shown to the left.

7.5mW	470CB290-0105	470CB290-0106
5.5mW	470CB290-0102	470CB290-0104
3.4mW	470CB290-0101	470CB290-0103
2.0mW		
	465nm	470nm

**C470CB290-S0100**

4.0mW	505CB290-0103	505CB290-0104
2.5mW	505CB290-0101	505CB290-0102
1.5mW		
	500nm	505nm

**C505CB290-S0100**

**C527CB290-S0100**

3.5mW	527CB290-0104	527CB290-0105	527CB290-0106
1.7mW	527CB290-0101	527CB290-0102	527CB290-0103
1.0mW			
	520nm	525nm	530nm

## Characteristic Curves

