

Features

- XBright™ Performance
 - 12.0 mW min Blue (460nm and 470nm)
 - 7.0 mW min Green (527nm)
- Single Wire Bond Structure
- Class II ESD Rating

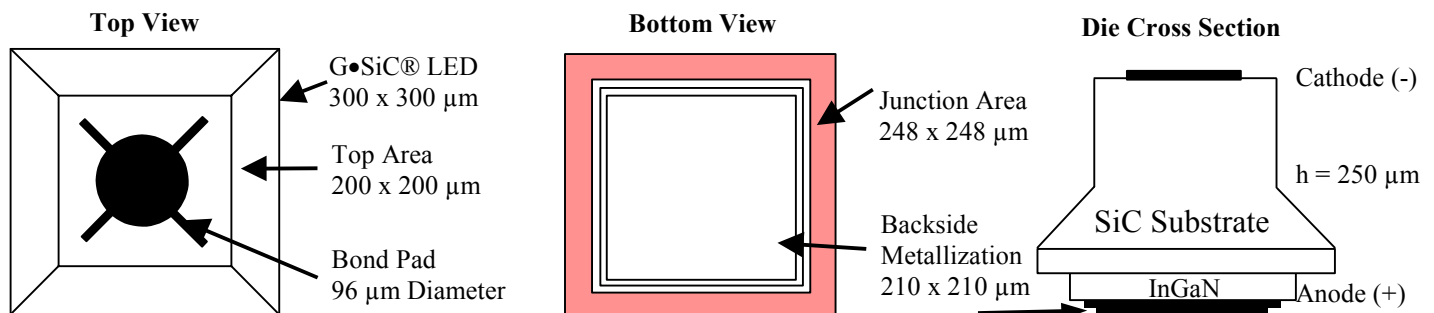
Applications

- Outdoor LED Video Displays
- Automotive Dashboard Lighting
- White LEDs
- Backlighting

Description

Cree's XB™ series of XBright™ LEDs are the next generation of solid state LED emitters that combine highly efficient InGaN materials with Cree's proprietary G•SiC® substrate to deliver superior price performance for high intensity LEDs. These LED chips have a geometrically enhanced Epi-down design to maximize light extraction efficiency, and require only a single wire bond connection. Cree's XB 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 full motion LED video signs, automotive lighting and white LEDs, yet can also be used in high volume applications such as LCD backlighting.

Cxxx-XB290-S0100-A Chip Diagram





G•SiC® Technology
XBright™ LEDs
Cxxx-XB290-S0100-A

Maximum Ratings at $T_A = 25^\circ\text{C}$ ^{Notes 1&3}		Cxxx-XB290-S0100-A
DC Forward Current		30mA
Peak Forward Current (1/10 duty cycle @ 1kHz)		100mA
LED Junction Temperature		125°C
Reverse Voltage		5 V
Operating Temperature Range		-40°C to +100°C
Storage Temperature Range		-40°C to +100°C
Electrostatic Discharge Threshold (HBM) ^{Note 2}		1000V
Electrostatic Discharge Classification (MIL-STD-883E) ^{Note 2}		Class 2

Typical Electrical/Optical Characteristics at $T_A = 25^\circ\text{C}$, $I_f = 20\text{mA}$ ^{Note 3}

Sorted Kit Part number	Forward Voltage (V_f , V)		Reverse Current [$I(V_r=5\text{V})$, μA]
	Typ	Max	
C460-XB290-S0100-A	3.6	4.0	10
C470-XB290-S0100-A	3.6	4.0	10
C527XB290-S0100-A	3.7	4.0	10

Mechanical Specifications		Cxxx-XB290-S0100-A
Description	Dimension	Tolerance
P-N Junction Area (μm)	248 x 248	± 25
Top Area (μm)	200 x 200	± 25
Bottom Area (Substrate) (μm)	300 x 300	± 25
Chip Thickness (μm)	250	± 25
Au Bond Pad Diameter (μm)	96	-5, +15
Au Bond Pad Thickness (μm)	1.2	± 0.5
Au/Sn Back Contact Metal Area (μm)	210 x 210	± 25
Au/Sn Back Contact Metal Thickness (μm)	1.7	± 0.3

Notes:

- Maximum ratings are package dependent. The above ratings were determined using a T-1 3/4 package (with Hysol OS4000 epoxy) for characterization. Seller makes no representations regarding ratings for packages other than the T-1 3/4 package used by Seller. The forward currents (DC and Peak) are not limited by the G •SiC 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). See Cree XBright Applications Note for more assembly process information.
- Product resistance to electrostatic discharge (ESD) is measured by simulating ESD using a rapid avalanche energy test (RAET). The RAET procedures are designed to approximate the maximum ESD ratings shown. Seller gives no other assurances regarding the ability of Products to withstand ESD.
- 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 the average values expected by Seller in large quantities and are provided for information only. Seller gives no assurances Products shipped will exhibit such typical ratings. All measurements were made using lamps in T-1 3/4 packages with Hysol OS4000 epoxy. Optical characteristics were measured in an integrating sphere. Illuminance E.

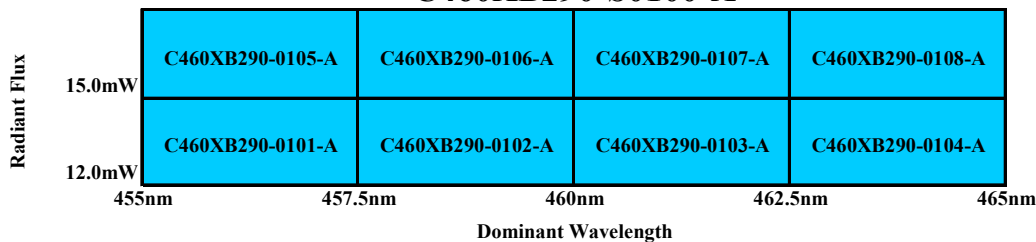
Notes (continued):

- 4) Back contact metal is 80%/20% Au/Sn by weight, with target eutectic melting temperature of approximately 282°C. See XBright Applications Note for detailed packaging recommendations.
- 5) **Caution:** To avoid leakage currents and achieve maximum output efficiency, die attach material must not contact the side of the chip. See Cree XBright Applications Note for more information.

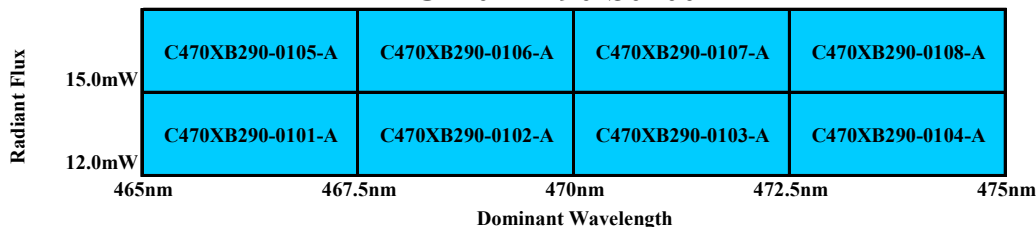
Standard Bins for XB290:

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-XB290-S0100-A) orders may be filled with any or all bins (Cxxx-XB290-01xx-A) contained in the kit.

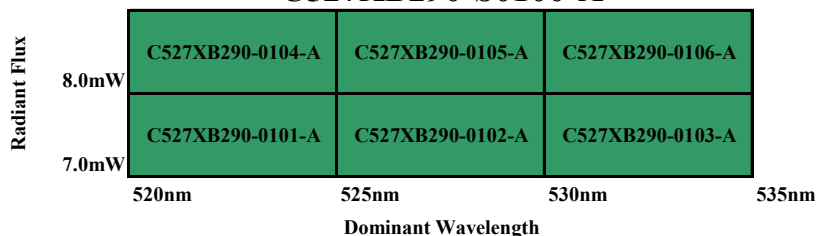
C460XB290-S0100-A



C470XB290-S0100-A



C527XB290-S0100-A



Characteristic Curves:

These are representative measurements for blue XBright products. Actual curves will vary slightly for the various radiant flux and dominant wavelength bins.

