XBright® Power Chip LED
C*xxx*XB500-S*xx*00-A

Cree's XB™ power chip series of 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. These LEDs are useful in a broad range of applications such as outdoor full-motion LED video signs, automotive lighting and white LEDs. Cree's XB power chips are compatible with optical power packages that employ proper thermal management.

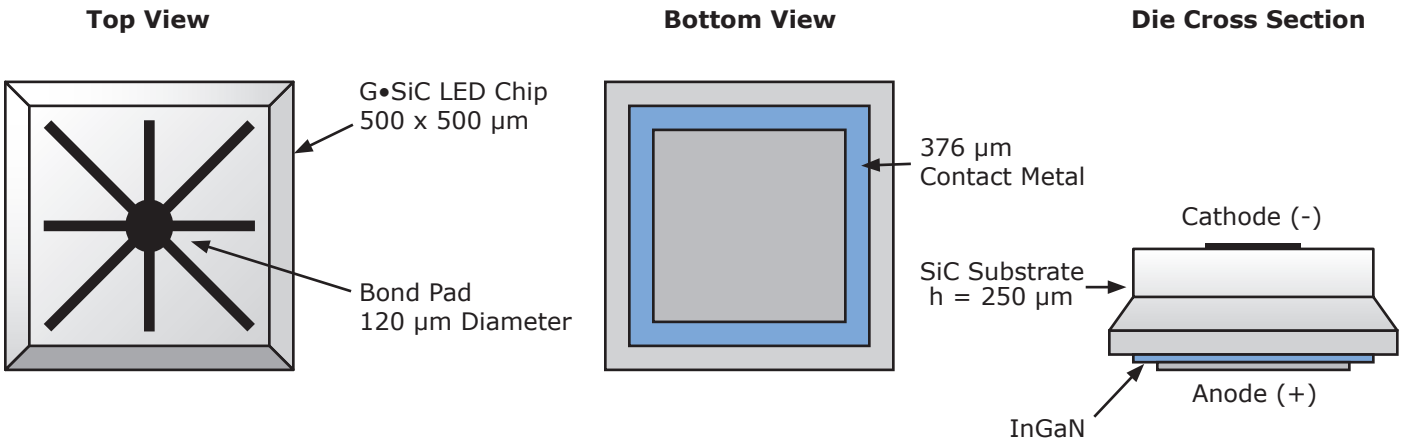
FEATURES

- XBright LED Technology
- Larger "Power Chip" Design
- High Performance
  - 35 mW min. (460 nm) Blue
  - 30 mW min. (470 nm) Blue
  - 20 mW min. (505 nm) Traffic Green
  - 15 mW min. (527 nm) Green
- Single Wire Bond Structure
- AuSn Backside Metal

APPLICATIONS

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

C*xxx*XB500-S*xx*00-A Chip Diagram



Maximum Ratings at T_A = 25°C [Note 1]	C*xxx*XB500-S*xx*00-A
DC Forward Current	150mA[Note 2]
Peak Forward Current (1/10 duty cycle @ 1kHz)	200mA
LED Junction Temperature	125°C
Reverse Voltage	5 V
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-40°C to +100°C
Electrostatic Discharge Threshold (HBM)[Note 3]	1000V
Electrostatic Discharge Classification (MIL-STD-883E)[Note 3]	Class 2

Typical Electrical/Optical Characteristics at T_A = 25°C, If = 125mA [Note 2]

Part Number	Forward Voltage (V_f, V)			Reverse Current [I(Vr=5V), µA]	Full Width Half Max (λ_D, nm)
	Min.	Typ.	Max.	Max.	Typ.
C460XB500-S3500-A	3.0	3.5	4.0	2	21
C470XB500-S3000-A	3.0	3.5	4.0	2	22
C505XB500-S2000-A	3.0	3.5	4.0	2	30
C527XB500-S1500-A	3.0	3.5	4.0	2	35

Mechanical Specifications	C*xxx*XB500-S0100-A	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	448 x 448	± 25
Top Area (µm)	325 x 325	± 25
Bottom Area (µm)	500 x 500	± 50
Chip Thickness (µm)	250	± 25
Au Bond Pad Diameter (µm)	120	± 10
Au Bond Pad Thickness (µm)	1.2	± 0.5
Back Contact Metal Area (µm)	376 x 376	± 25
Back Contact Metal Options/Thickness (µm)	1.7	± 0.3

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).
2. All Products conform to the listed minimum and maximum specifications for electrical and optical characteristics when assembled and operated at 125 mA within the maximum ratings shown above. Efficiency decreases at higher currents. Typical values given are within the range of average expected by 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. 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 2 is based on sample testing according to MIL-STD-883E.
4. Back contact metal is 80%/20% Au/Sn by weight, with target eutectic melting temperature of approximately 282°C.
5. Caution: To avoid leakage currents and achieve maximum output efficiency, die attach material must not contact the side of the chip.
6. XB500™ chips are shipped with the junction side up, requiring die transfer prior to die attach.
7. Specifications are subject to change without notice.

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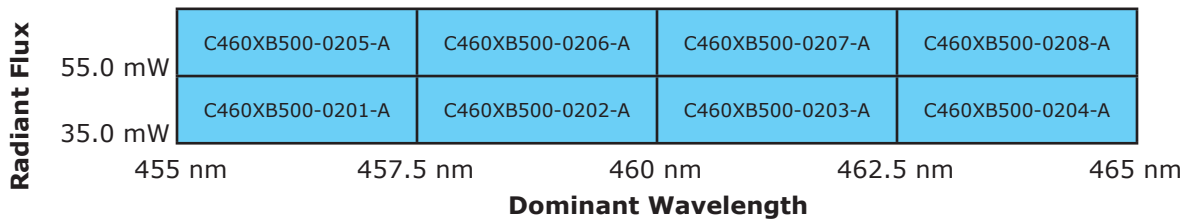
Standard Bins for C*xxx*XB500-S*xx*00-A

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 (C*xxx*XB500-S*xx*00-A) orders may be filled with any or all bins (C*xxx*XB500-02*xx*-A) contained in the kit. All radiant flux and all dominant wavelength values shown and specified are at If = 125 mA. Radiant flux values are measured using Au-plated TO39 headers without an encapsulant.

C460XB500-S3500-A



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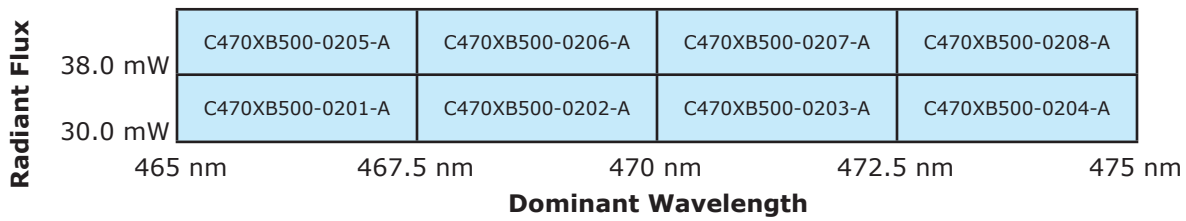

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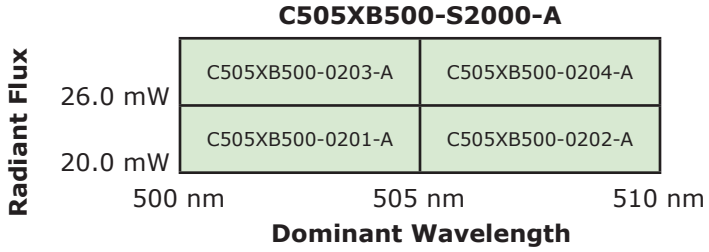
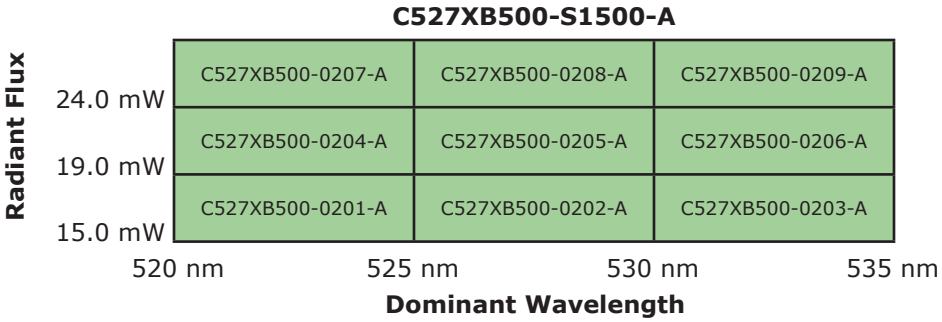


C527XB500-S1500-A



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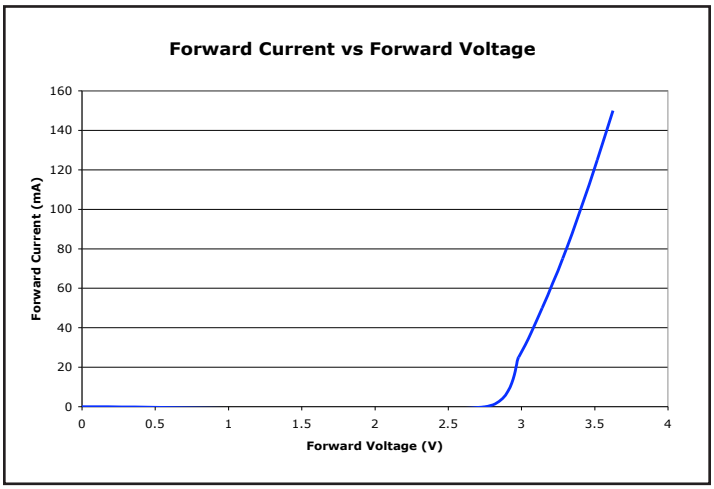
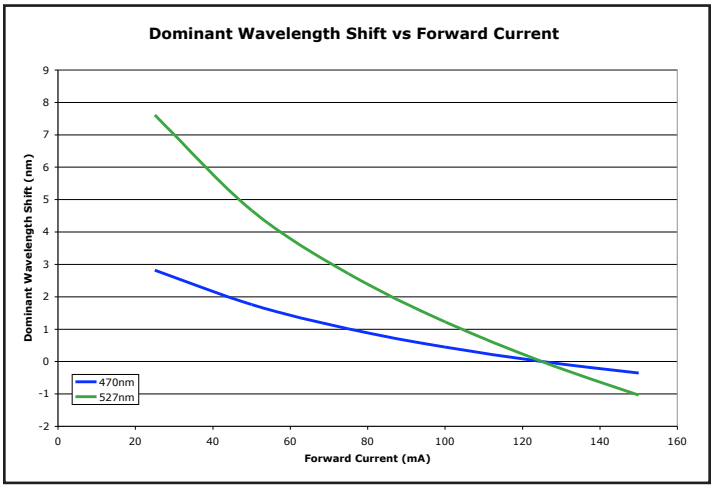
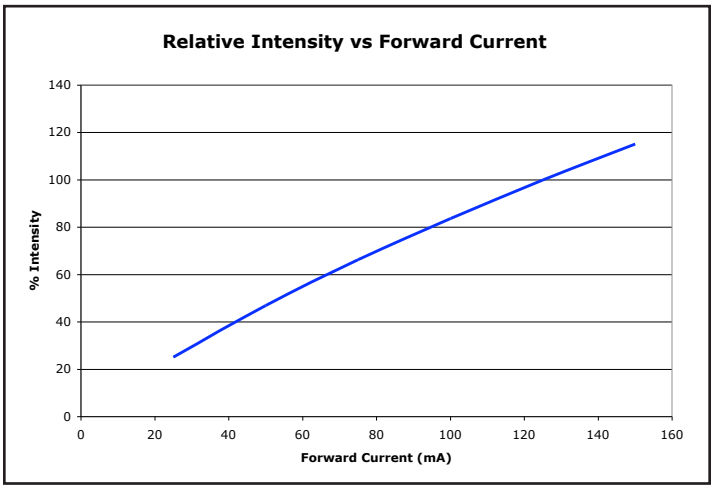
Characteristic Curves, T_A = 25˚C







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