

## Features

- Mega Bright
- High Performance
  - 11.0mW (460nm) Deep Blue
  - 10.0mW (470nm) Blue
- Single Wire Bond Structure
- Class II ESD Rating

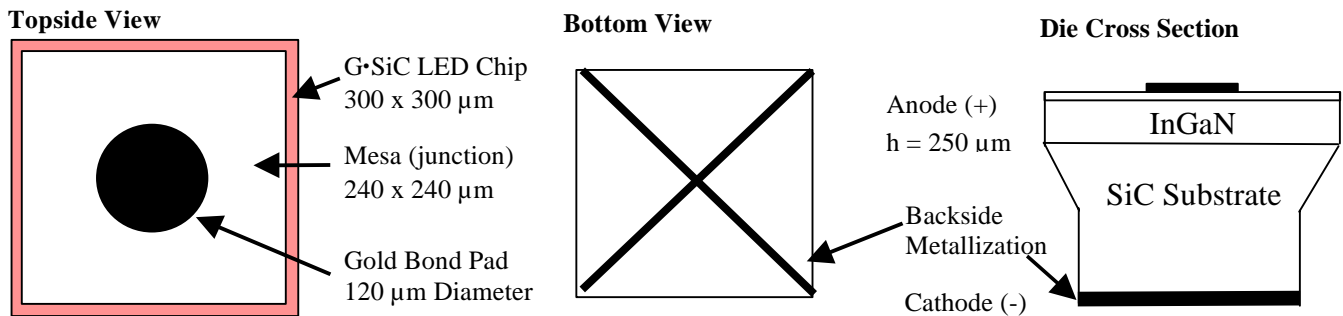
## Applications

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

## Description

Cree's MB series of mega bright LEDs are the next generation of solid state LED emitters which combine highly efficient InGaN materials with Cree's proprietary SiC substrate to deliver superior price performance for high intensity blue LEDs. These LED chips have a geometrically enhanced vertical chip structure to maximize light extraction efficiency, and require only a single wire bond connection. Cree's MB 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 full motion LED video signs, automotive lighting and white LEDs, yet can also be used in high volume applications such as LCD backlighting. Cree's MB series chips are compatible with most radial and SMT LED assembly processes.

## CXXX-MB290-E1000 Chip Diagram



**G•SiC<sup>®</sup> Technology**  
**Mega Bright LEDs**  
**CXXX-MB290-E1000**

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

<b>CXXX-MB290-E1000</b>	
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	-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 ( $V_f$ , V)		Radiant Flux (P, mW)		Reverse Current [I( $V_r=5\text{V}$ ), $\mu\text{A}$ ]	Flux (mIm)	Peak Wavelength ( $\lambda_p$ , nm)	Dominant Wavelength ( $\lambda_d$ , nm)			Halfwidth ( $\lambda_D$ , nm)	Optical Rise Time ( $\tau$ , ns)
	Typ	Max	Min	Typ	Max	Typ	Typ	Min	Typ	Max	Typ	Typ
C460	3.6	4.0	8.0	11.0	10	880	458	455	460	465	26	30
C470	3.6	4.0	7.5	10.0	10	880	468	465	470	475	26	30

**Mechanical Specifications** <sup>Note 4</sup>

<b>CXXX-MB290-E1000</b>		
Description	Dimension	Tolerance
P-N Junction Area ( $\mu\text{m}$ )	240 x 240	$\pm 25$
Top Area ( $\mu\text{m}$ )	300 x 300	$\pm 50$
Bottom Area ( $\mu\text{m}$ )	200 x 200	$\pm 25$
Chip Thickness ( $\mu\text{m}$ )	250	$\pm 25$
Au Bond Pad Diameter ( $\mu\text{m}$ )	120	$\pm 20$
Au Bond Pad Thickness ( $\mu\text{m}$ )	1.2	$\pm 0.5$
Back Contact Metal Width ( $\mu\text{m}$ )	15	-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. 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 350°C (< 15 minutes).
- 2) 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.
- 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 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 a Photoresearch Spectrascan Integrating Sphere. Illuminance E.
- 4) All Products conform to the listed mechanical specifications within the tolerances shown.
- 5) **Caution: To obtain optimum output efficiency, the maximum height of die attach epoxy on the side of the chip should not exceed 80 $\mu\text{m}$ .**