The Leader in Silicon Carbide Solid State Technology

G·SiC® Technology
MegaBright™ LEDs
CXXX-MB290-EXXXX

Features

- MegaBright™
- High Performance
  - 11.0mW (395nm) UV
  - 12.0mW (400, 405nm) UV
  - 11.0mW (460nm) Deep Blue
  - 10.0mW (470nm) Blue
  - 8.0mW (505nm) Traffic Green
  - 7.0mW (527nm) Green
- Single Wire Bond Structure
- Class II ESD Rating (Class I for UV)

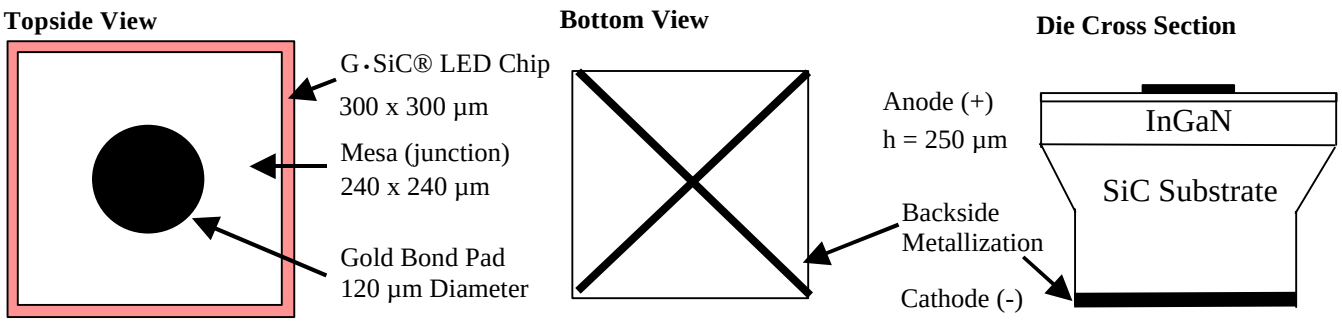
Applications

- Outdoor LED Video Displays
- Automotive Dashboard Lighting
- White LEDs
- Backlighting
- Traffic Signals
- Counterfeit Bill Detection

Description

Cree's MB™ series of MegaBright™ LEDs is a new 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 (400V for UV). 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-EXXXX Chip Diagram



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Maximum Ratings at T_A = 25°C Notes 1&3

	CXXX-MB290-EXXXX
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) Note 2	1000 V
Electrostatic Discharge Classification (MIL-STD-883E) Note 2	Class 2 (Class 1 for UV)

Typical Electrical/Optical Characteristics at T_A = 25°C, If = 20mA Note 3

Part Number	Forward Voltage (V_f, V)		Radiant Flux (P, mW)		Reverse Current [I(Vr=5V), µA]	Flux (mlm)	Peak Wavelength (λ_p, nm)			Dominant Wavelength (λ_d, nm)			Halfwidth (λ_D, nm)	Optical Rise Time (τ, ns)
	Typ	Max	Min	Typ	Max	Typ	Min	Typ	Max	Min	Typ	Max	Typ	Typ
C395-MB290-E400	3.7	4.0	9.0	11.0	10	-	390	395	400		-		-	30
C400-MB290-E400	3.7	4.0	10.0	12.0	10	-	390	400	410		-		-	30
C405-MB290-E400	3.7	4.0	10.0	12.0	10	-	400	405	410		-		-	30
C460-MB290-E1000	3.7	4.0	8.0	11.0	10	520		458		455	460	465	26	30
C470-MB290-E1000	3.7	4.0	7.5	10.0	10	750		468		465	470	475	26	30
C503-MB290-E1000	3.8	4.0	6.0	8.0	10	2450		500		498	503	508	30	30
C505-MB290-E1000	3.8	4.0	6.0	8.0	10	2580		502		500	505	510	30	30
C527-MB290-E1000	3.8	4.0	5.0	7.0	10	3400		518		520	527	535	35	30

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Mechanical Specifications Note 4	**CXXX-MB290-EXXXX**	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	240 x 240	± 25
Top Area (µm)	300 x 300	± 50
Bottom Area (µm)	200 x 200	± 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)	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 (Hysol OS1600 for UV chips) 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 (Hysol OS1600 epoxy for UV chips). 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 80µm.**