Features

- MegaBright® Performance
  - 9.0mW min (395nm) Ultraviolet
  - 10.0mW min (405nm) Ultraviolet

- Single Wire Bond Structure

- Class I ESD Rating
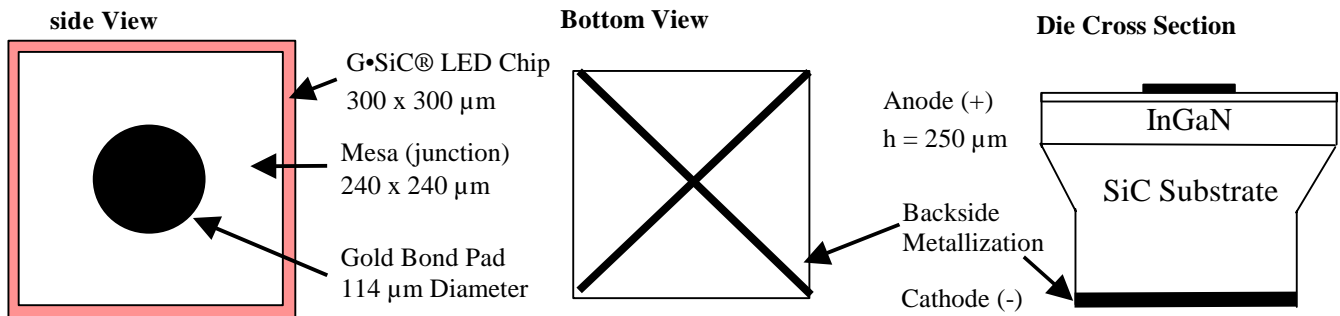
Applications

- White LEDs

- Counterfeit Bill Detection

Description

Cree's MB™ series of MegaBright® LEDs combine highly efficient InGaN materials with Cree's proprietary G•SiC® substrate to deliver superior price performance for high intensity UltraViolet 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 tested for conformity to optical and electrical specifications and the ability to withstand 400V ESD. These LEDs are useful in a broad range of applications such as white light applications and counterfeit bill detection, yet can also be used in high volume applications. Cree's MB series chips are compatible with most radial and SMT LED assembly processes.

Cxxx-MB290-S0100 Chip Diagram

side View

G•SiC® LED Chip
300 x 300 µm

Mesa (junction)
240 x 240 µm

Gold Bond Pad
114 µm Diameter

Bottom View

Die Cross Section

Anode (+)
h = 250 µm

InGaN

SiC Substrate

Backside
Metallization

Cathode (-)

Maximum Ratings at T_A = 25•C [Notes 1&3]	C*xxx*-MB290-S0100
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]	400 V
Electrostatic Discharge Classification (MIL-STD-883E) [Note 2]	Class 1

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

Part Number	Forward Voltage (V_f, V)		Reverse Current $[I(Vr=5V), \mu A]$	Peak Wavelength (λ_p, nm)			Optical Rise Time (τ, ns)
	Typ	Max	Max	Min	Typ	Max	Typ
C395-MB290-S0100	3.7	4.0	10	390	395	400	30
C400-MB290-S0100	3.7	4.0	10	390	400	410	30
C405-MB290-S0100	3.7	4.0	10	400	405	410	30

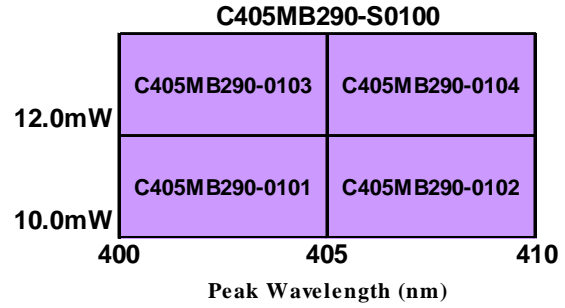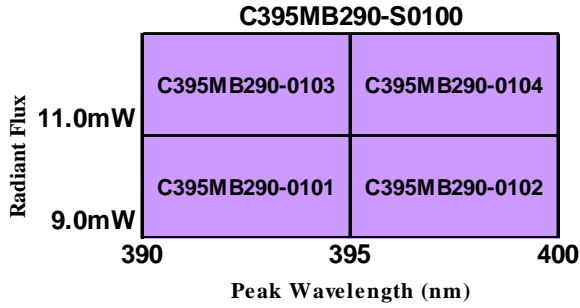| *Mechanical Specifications* [Note 4]	*Cxxx*-MB290-S0100	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	240 x 240	± 25
Top Area (µm)	300 x 300	± 25
Bottom Area (µm)	200 x 200	± 25
Chip Thickness (µm)	250	± 25
Au Bond Pad Diameter (µm)	114	± 20
Au Bond Pad Thickness (µm)	1.2	± 0.5
Back 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 OS1600 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).

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 OS1600 epoxy.

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.**

Standard Bins for UltraViolet MB290:

LED chips are sorted to the **radiant flux** and **peak wavelength** bins. A sorted die sheet contains die from only one bin. Sorted die kit (C*xxx*-MB290-S0100) orders may be filled with any or all bins (C*xxx*-MB290-01*xx*) contained in the kit.

C395MB290-S0100

C395MB290-0103	C395MB290-0104
C395MB290-0101	C395MB290-0102

Radiant Flux: 11.0mW, 9.0mW

Peak Wavelength (nm): 390, 395, 400

C405MB290-S0100

C405MB290-0103	C405MB290-0104
C405MB290-0101	C405MB290-0102

Radiant Flux: 12.0mW, 10.0mW

Peak Wavelength (nm): 400, 405, 410

C400MB290-S0100 Sorted Die Kit contains all bins shown above (390-410nm).