

Features

- UltraBright™ Performance
 - 3.8mW min (460nm) Deep Blue
 - 3.4mW min (470nm) Blue
 - 2.5mW min (505nm) Signal Green
 - 1.7mW min (527nm) Green
- Sorted to Wavelength and Power Bins
- Single Wire Bond Structure
- Class II ESD Rating

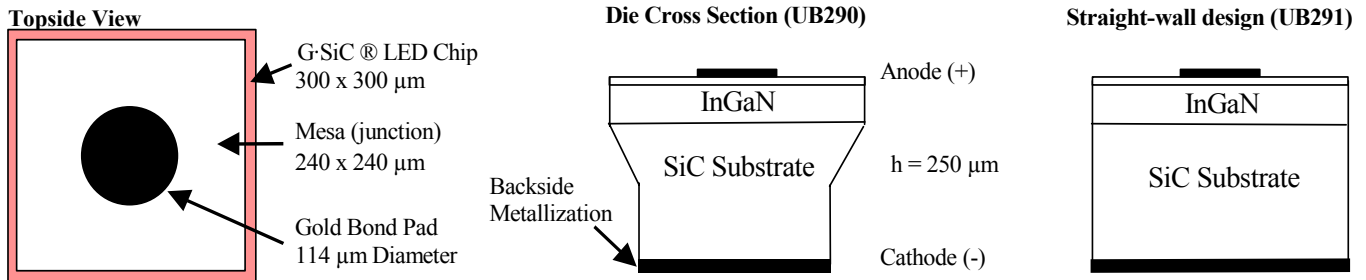
Applications

- LED Video Displays
- White LEDs
- Automotive Dashboard Lighting
- Cellular Phone Backlighting
- Audio Product Display Lighting

Description

Cree's UB™ series of UltraBright™ LEDs combine highly efficient InGaN materials with Cree's proprietary SiC® substrate to deliver excellent price performance for high intensity blue and green LEDs. UltraBright LED chips are available in a geometrically enhanced vertical structure or a straight-wall design for use in reflector-less applications such as ChipLEDs. Both require only a single wire bond connection. Sorted Die Kits provide die sheets conveniently sorted into wavelength and radiant flux bins. Cree's UB 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 and indoor full motion LED video signs, transportation signaling and white LEDs, yet can also be used in high volume applications such as LCD backlighting. Cree's CB series chips are compatible with most radial and SMT LED assembly processes.

CXXX-UB29X-S0100 Chip Diagram



Maximum Ratings at $T_A = 25^\circ\text{C}$ ^{Notes 1&3}

CXXX-UB29X-S0100	
DC Forward Current	30 mA
Peak Forward Current (1/10 duty cycle @ 1kHz)	100 mA
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

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

Part Number	Forward Voltage (V _f , V)		Reverse Current [I(V _r =5V), μA]	Peak Wavelength (λ _p , nm)	Halfwidth (λ _D , nm)	Optical Rise Time (τ, ns)
	Typ	Max	Max	Typ	Typ	Typ
C460UB29X-S0100	3.5	3.9	10	458	26	30
C470UB29X-S0100	3.5	3.9	10	468	26	30
C505UB29X-S0100	3.5	3.9	10	502	30	30
C527UB29X-S0100	3.5	3.9	10	518	36	30

Mechanical Specifications ^{Note 4}

CXXX-UB29X-S0100

Description	Dimension	Tolerance
P-N Junction Area (μm)	240 x 240	± 25
Top Area (μm)	300 x 300	± 25
UB290 Bottom Area (μm)	200 x 200	± 25
UB291 Bottom Area (μm)	300 x 300	± 25
Chip Thickness (μm)	250	± 25
Au Bond Pad Diameter (μm)	114	± 20
Au Bond Pad Thickness (μm)	1.2	± 0.5

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. Ratings for other packages may differ. The forward currents (DC and Peak) are not limited by the 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) 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 II is based on sample testing according to MIL-STD 883E.

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 within the range of average values expected by the manufacturer in large quantities and are provided for information only. 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) Specifications are subject to change without notice.

Standard Bins for UB290:

All LED chips are sorted onto die sheets according to the bins shown below.

8.0mW	460UB290-0103	460UB290-0104
6.0mW	460UB290-0101	460UB290-0102
3.8mW		
	455nm	460nm
		465nm

C460UB290-S0100

Sorted Die Kits may contain any or all bins shown to the left.

7.5mW	470UB290-0103	470UB290-0104
5.5mW	470UB290-0101	470UB290-0102
3.4mW		
	465nm	470nm
		475nm

C470UB290-S0100

6.0mW	505UB290-0103	505UB290-0104
4.0mW	505UB290-0101	505UB290-0102
2.5mW		
	500nm	505nm
		510nm

C505UB290-S0100

C527UB290-S0100

5.0mW	527UB290-0104	527UB290-0105	527UB290-0106
3.5mW	527UB290-0101	527UB290-0102	527UB290-0103
1.7mW			
	520nm	525nm	530nm
			535nm

Standard Bins for UB291:

All LED chips are sorted onto die sheets according to the bins shown below.

11.0mW	460UB291-0105	460UB291-0106
8.0mW	460UB291-0103	460UB291-0104
6.0mW	460UB291-0101	460UB291-0102
3.8mW		
	455nm	460nm
		465nm

C460UB291-S0100

Sorted Die Kits may contain any or all bins shown to the left.

10.0mW	470UB291-0107	470UB291-0108
7.5mW	470UB291-0105	470UB291-0106
5.5mW	470UB291-0101	470UB291-0103
3.4mW		
	465nm	470nm
		475nm

C470UB291-S0100

6.0mW	505UB291-0103	505UB291-0104
4.0mW	505UB291-0101	505UB291-0102
2.5mW		
	500nm	505nm
		510nm

C505UB291-S0100

C527UB291-S0100

5.0mW	527UB291-0104	527UB291-0105	527UB291-0106
3.5mW	527UB291-0101	527UB291-0102	527UB291-0103
1.7mW			
	520nm	525nm	530nm
			535nm

Characteristic Curves

**G·SiC[®] Technology
UltraBright™ LEDs
CXXX-UB29X-S0100**

