UltraThin™ LEDs
C*xxx*UT230-S0002

Cree's UltraThin LEDs combine highly efficient InGaN materials with Cree's proprietary G•SiC® substrate to deliver superior price/performance for blue and green LEDs. These vertically structured LED chips are small in size and require a low forward voltage. Cree's UT™ series chips are tested for conformity to optical and electrical specifications and the ability to withstand 1000 V ESD. Applications include keypad backlighting where sub-miniaturization and thinner form factors are required.

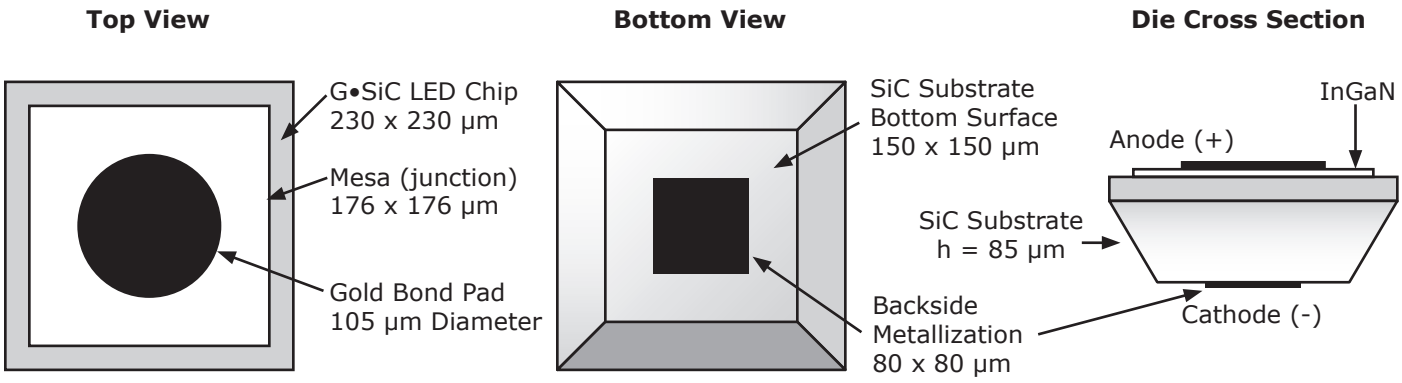
FEATURES

- Small Chip – 230 x 230 x 85 µm
- UT LED Performance
  - 5.5 mW min. (455–475 nm) Blue
  - 2.5 mW min. (500-510 nm) Traffic Green
  - 2.5 mW min. (520-535 nm) Green
- Low Forward Voltage
  - 2.9–3.0 V Typical at 5 mA
- Single Wire Bond Structure
- Class 2 ESD Rating

APPLICATIONS

- Mobile Phone Keypads
- Audio Product Display Lighting
- Mobile Appliance Keypads
- Automotive Applications

C*xxx*UT230-S0002 Chip Diagram



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Maximum Ratings at T_A = 25°C Notes 1&3	C*xxx*UT230-S0002
DC Forward Current	30 mA
Peak Forward Current (1/10 duty cycle @ 1 kHz)	100 mA
LED Junction Temperature	125°C
Reverse Voltage	5 V
Operating Temperature Range	-40°C to +100°C
Storage Temperature Range	-40°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°C, If = 5 mA Note 3

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.
C460UT230-S0002	2.7	2.9	3.1	1	21
C470UT230-S0002	2.7	2.9	3.1	1	22
C505UT230-S0002	2.7	2.9	3.2	1	30
C527UT230-S0002	2.7	3.0	3.2	1	35

Mechanical Specifications	C*xxx*UT230-S0002	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	176 x 176	± 25
Top Area (µm)	230 x 230	± 25
Bottom Area (Substrate) (µm)	150 x 150	± 25
Chip Thickness (µm)	85	± 10
Au Bond Pad Diameter (µm)	105	-5, +15
Au Bond Pad Thickness (µm)	1.2	± 0.5
Back Contact Metal Area (µm)	80 x 80	± 25

Notes:

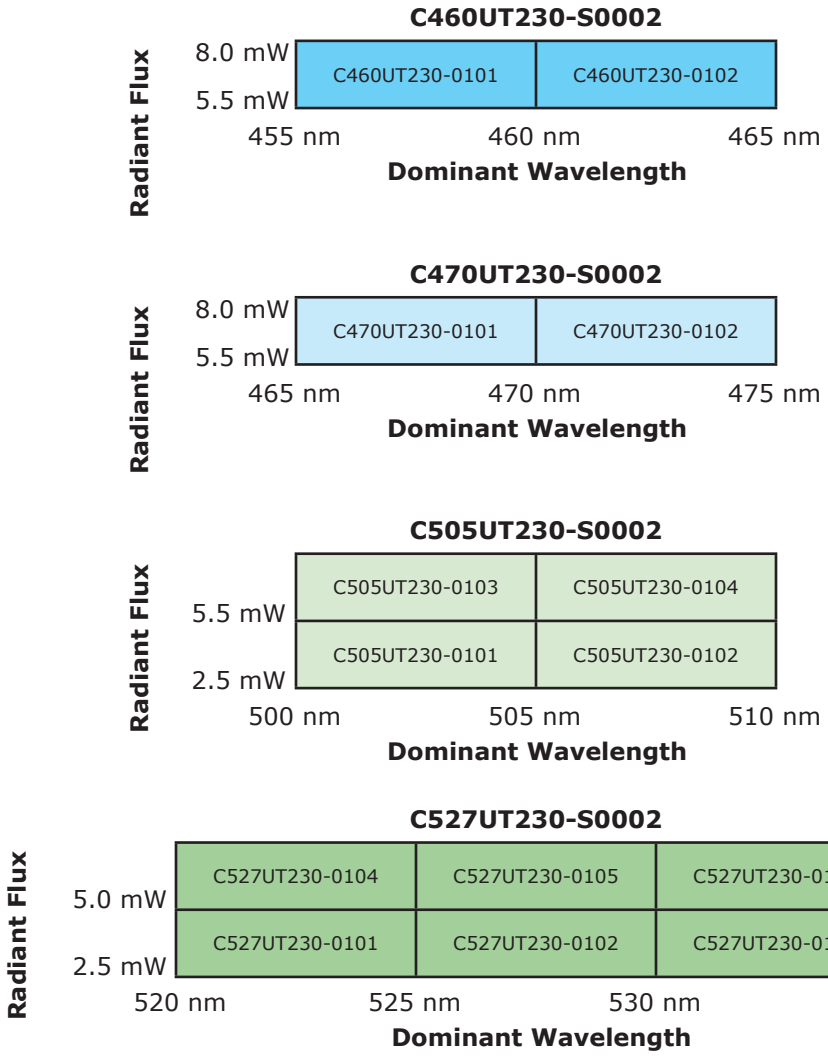
1. Maximum ratings are package dependent. The above ratings were determined using a T-1 3/4 package (with Hysol OS4000 epoxy) for characterization. Ratings for other packages may differ. The forward currents (DC and Peak) are not limited by the die but by the effect of the LED junction temperature on 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 325°C (< 5 seconds).
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 minimum ESD ratings shown. The ESD classification of Class 2 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 5 mA within the maximum ratings shown above. Efficiency decreases at higher currents. Typical values given are within the range of average values expected by 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 measured in an integrating sphere using Illuminance E.
4. Caution: To obtain optimum output efficiency, the amount of epoxy used should be characterized based upon the specific application.

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Standard Bins for C*xxx*UT230-S0002

LED chips are sorted to the **radiant flux** and **dominant wavelength** bins shown. Sorted die sheets contain die from only one bin. Sorted die kit (C*xxx*UT230-S0002) orders may be filled with any or all bins (C*xxx*UT230-0*xxx*) contained in the kit. All radiant flux values are measured at If = 20 mA and all dominant wavelength values are measured at If = 5 mA.

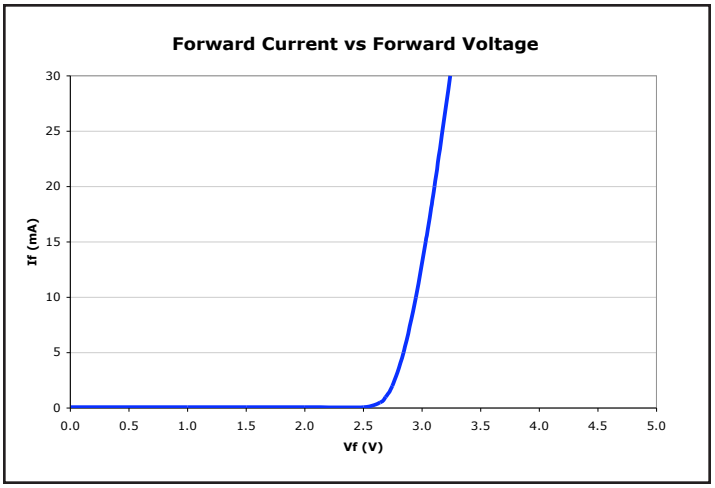


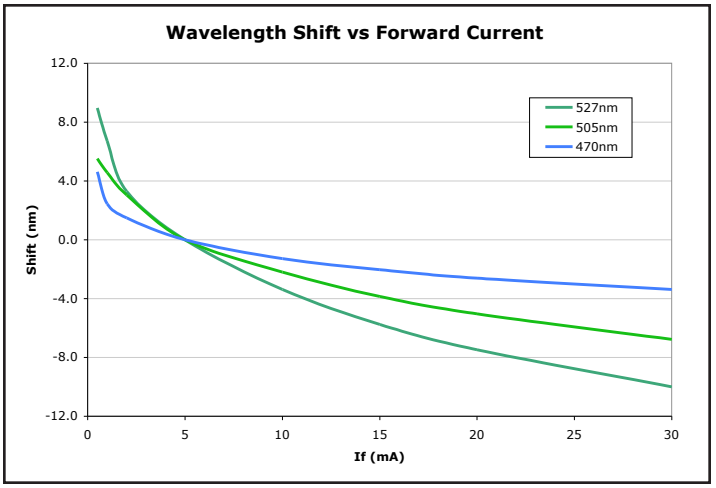
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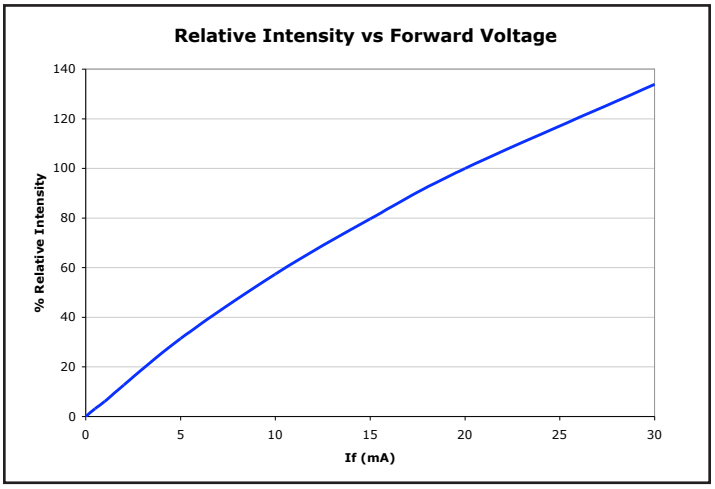
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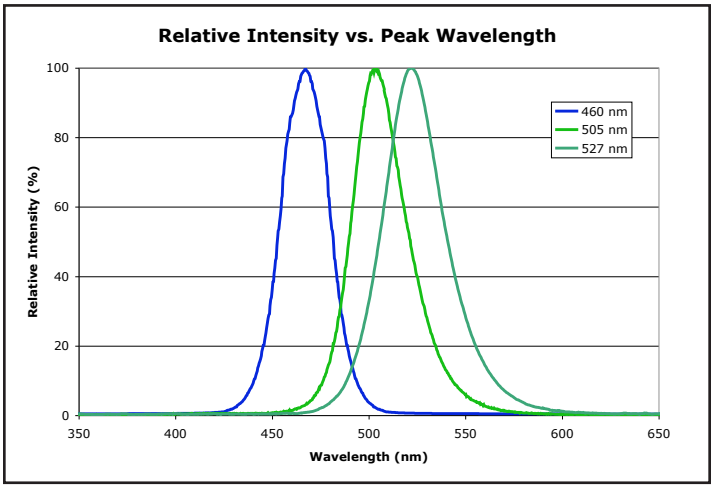
Characteristic Curves

These are representative measurements for the UT230 product. Actual curves will vary slightly for the various radiant flux and dominant wavelength bins.









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