Direct Attach DA350™ LEDs

C*xxx*DA3547-S*xx*00

Data Sheet

Cree's Direct Attach DA350 LEDs are the next generation of solid-state LED emitters that combine highly efficient InGaN materials with Cree's proprietary device technology and silicon-carbide substrates to deliver superior value for the TV-backlighting and general-illumination markets. The DA3547 LEDs are among the brightest in the top-view market while delivering a low forward voltage, resulting in a very bright and highly efficient solution. The bondpad-down design allows for eutectic die attach and enables superior performance from improved thermal management. The design is optimally suited for industry-standard top-view packages.

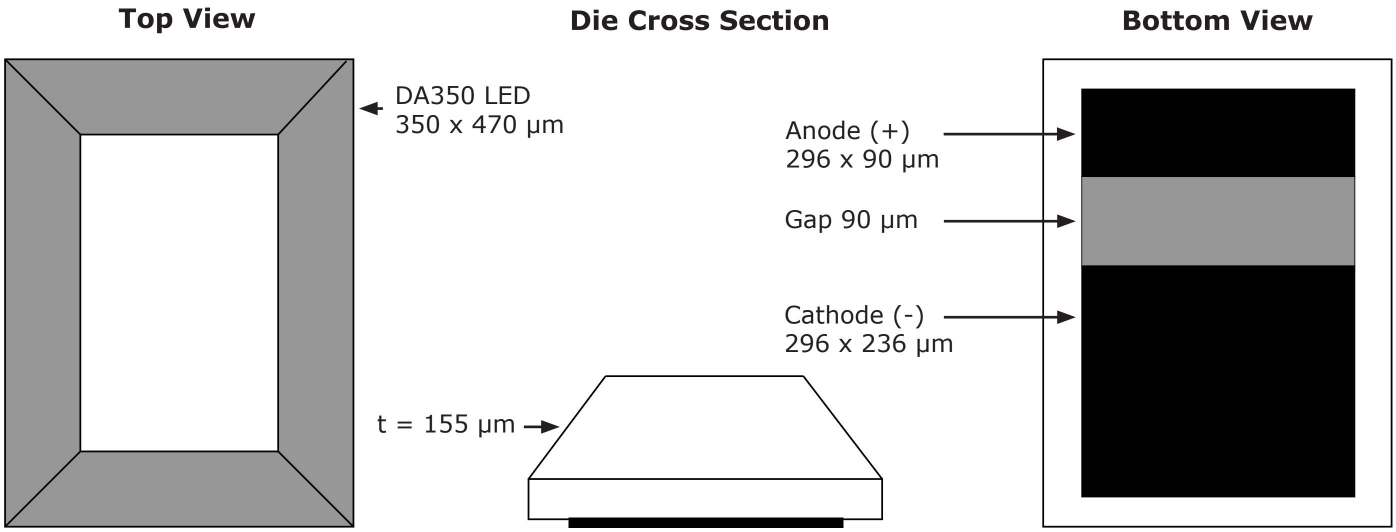
FEATURES

- Rectangular LED RF Performance
  - 450 & 460 nm – 76 mW min
- High Reliability - Eutectic Attach
- Low Forward Voltage (Vf) – 3.1 V Typical at 50 mA
- Maximum DC Forward Current – 200 mA
- 1000-V ESD Threshold Rating
- InGaN Junction-Down Design for Improved Thermal Management

APPLICATIONS

- Large LCD Backlighting
  - Television
- General Illumination
- Medium LCD Backlighting
  - Portable PCs
  - Monitors
- LED Video Displays
- White LEDs

C*xxx*DA3547-S*xx*00 Chip Diagram



Maximum Ratings at T_A = 25°C Notes 1&3	**C*xxx*DA3547-S*xx*00**
DC Forward Current	200 mA
Peak Forward Current (1/10 duty cycle @ 1 kHz)	250 mA
LED Junction Temperature	135°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 = 50 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.**
C450DA3547-S*xx*00	2.8	3.1	3.4	2	20
C460DA3547-S*xx*00	2.8	3.1	3.4	2	21

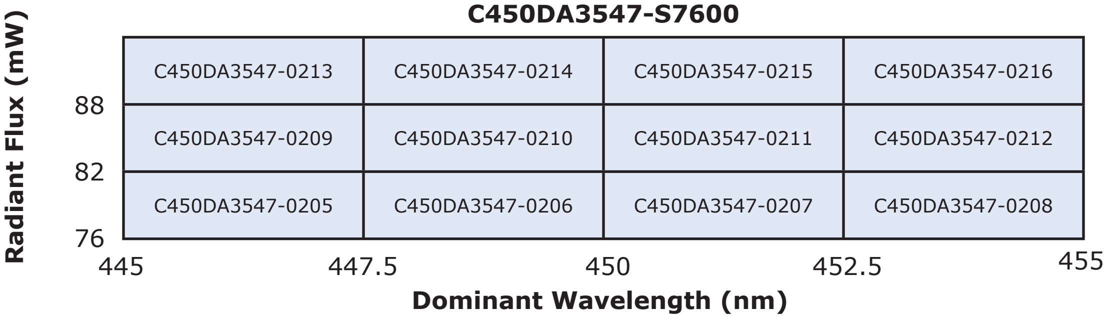
Mechanical Specifications	**C*xxx*DA3547-S*xx*00**	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	296 x 416	±35
Chip Bottom Area (µm)	350 x 470	±35
Chip Top Area (µm)	200 x 320	±35
Chip Thickness (µm)	155	±15
AuSn Bond Pad Width – Anode (um)	90	±15
AuSn Bond Pad Length – Anode (um)	296	±35
AuSn Bond Pad Width – Cathode (um)	236	±35
AuSn Bond Pad Length – Cathode (um)	296	±35
Bond Pad Gap (µm)	90	±15
AuSn Bond Pad Thickness (µm)	3	±0.5

Notes:

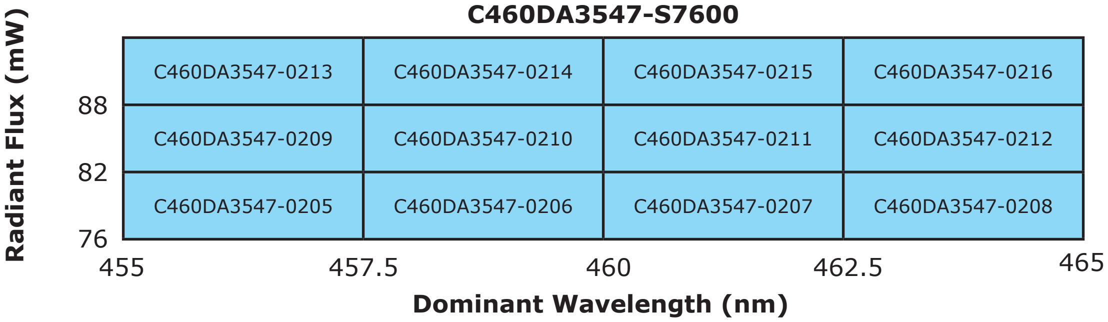
1. Maximum ratings are package-dependent. The above ratings were determined using a chip sub-mount on MCPCB (with silicone encapsulation and intrinsic AuSn metal die attach) for characterization. Ratings for other packages may differ. Junction temperature should be characterized in a specific package 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 maximum ESD ratings shown.
3. All products conform to the listed minimum and maximum specifications for electrical and optical characteristics when assembled and operated at 50 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 encapsulant and intrinsic AuSn metal die attach). Optical characteristics measured in an integrating sphere using Illuminance E.

Standard Bins for C*xxx*DA3547-S*xx*00

LED chips are sorted to the **radiant flux** and **dominant wavelength** bins shown. A sorted die sheet contains die from only one bin. Sorted die kit (C*xxx*DA3547-S*xxxx*) orders may be filled with any or all bins (C*xxx*DA3547-*xxxx*) contained in the kit. All radiant flux and dominant wavelength values shown and specified are at If = 50 mA.


C450DA3547-S7600

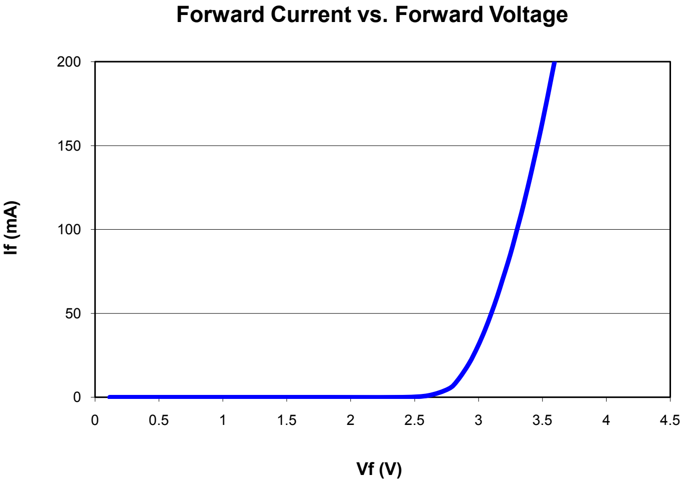
C450DA3547-0213	C450DA3547-0214	C450DA3547-0215	C450DA3547-0216
C450DA3547-0209	C450DA3547-0210	C450DA3547-0211	C450DA3547-0212
C450DA3547-0205	C450DA3547-0206	C450DA3547-0207	C450DA3547-0208

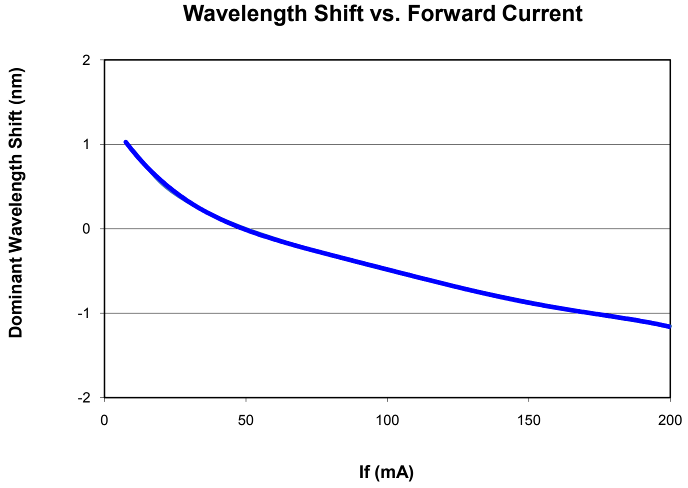

C460DA3547-S7600

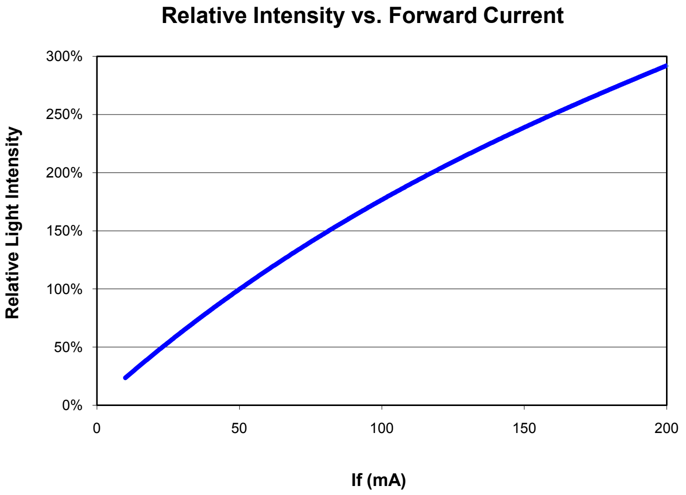
C460DA3547-0213	C460DA3547-0214	C460DA3547-0215	C460DA3547-0216
C460DA3547-0209	C460DA3547-0210	C460DA3547-0211	C460DA3547-0212
C460DA3547-0205	C460DA3547-0206	C460DA3547-0207	C460DA3547-0208

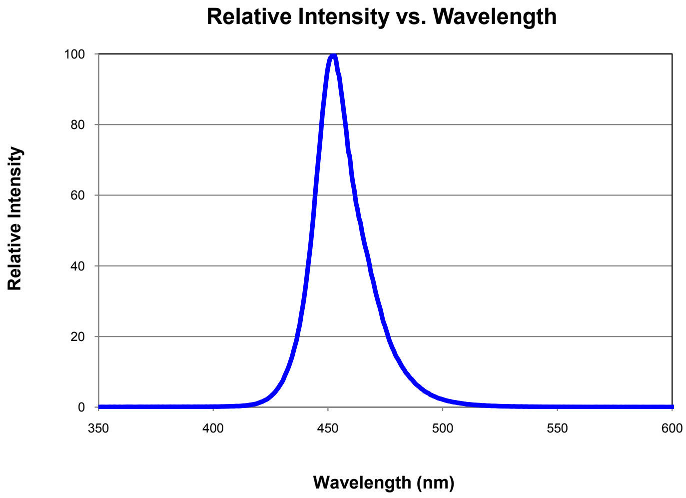
Characteristic Curves

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









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Radiation Pattern

This is a representative radiation pattern for the DA LED product. Actual patterns will vary slightly for each chip.