Cree® Direct Attach™ DA2432™ LEDs
CxxxDA2432-Sxxx00-2
Data Sheet

Cree's Direct Attach™ DA2432™ 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 LCD backlighting and general-illumination markets. The DA2432 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, eliminating the need for wire bonds, and enables superior performance from improved thermal management. The design is optimally suited for industry-standard top-view packages.

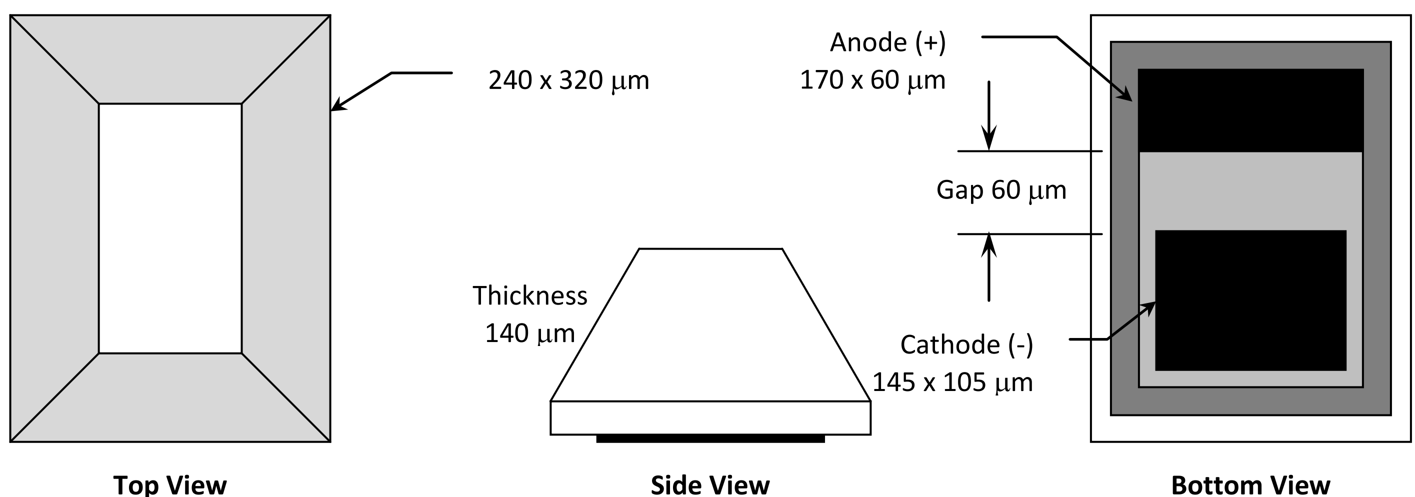
FEATURES

- Rectangular LED RF Performance
  - 450 & 460 nm – 33 mW min
  - 470 nm – 30 mW min
- High Reliability - Eutectic Attach
- Low Forward Voltage (Vf) – 3.1 V Typical at 20 mA
- Maximum DC Forward Current – 100 mA
- 1000-V ESD Threshold Rating
- InGaN Junction-Down Design for Improved Thermal Management
- Direct Attach - No wire bonding
- Excellent Performance over Temperature

APPLICATIONS

- General Illumination
  - White LEDs
  - Chip-on-Board (COB)
  - Multi-chip Arrays
  - High Voltage Arrays
- LCD Backlighting
  - Television
  - Monitors
  - Portable PCs & Tablets
- LED Video Displays

CxxxDA2432-Sxxx00-2 Chip Diagram



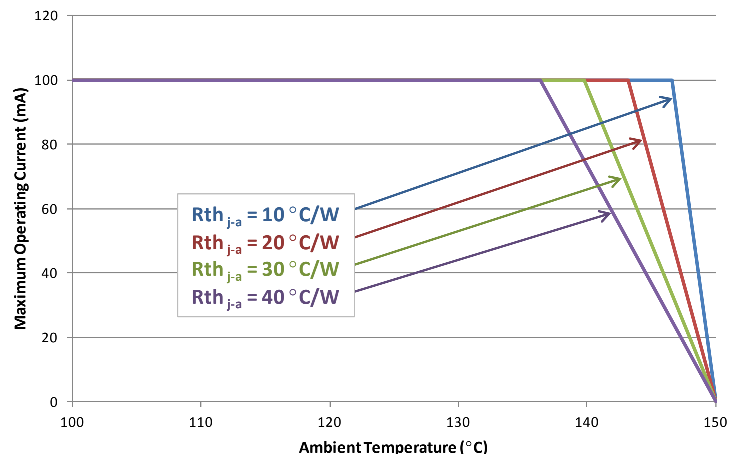
Maximum Ratings at T_A = 25°C Notes 1,3, & 4	CxxxDA2432-Sxxx00-2
DC Forward Current	100 mA
Peak Forward Current (1/10 duty cycle @ 1 kHz)	150 mA
LED Junction Temperature	150°C
Reverse Voltage	5 V
Operating Temperature Range	-40°C to +100°C
LED Chip Storage Temperature	-40°C to +120°C
Recommended Die Sheet Storage Conditions	≤30°C / ≤85% RH
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 = 20 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.
C450DA2432-Sxxx00-2	2.8	3.1	3.4	2	20
C460DA2432-Sxxx00-2	2.8	3.1	3.4	2	21
C470DA2432-Sxxx00-2	2.8	3.1	3.4	2	21

Mechanical Specifications	CxxxDA2432-Sxxx00-2	
Description	Dimension	Tolerance
P-N Junction Area (μm)	210 x 280	±35
Chip Bottom Area (μm)	240 x 320	±35
Chip Top Area (μm)	110 x 190	±35
Chip Thickness (μm)	140	±15
Bond Pad Width – Anode (um)	60	±15
Bond Pad Length – Anode (um)	170	±35
Bond Pad Width – Cathode (um)	105	±35
Bond Pad Length – Cathode (um)	145	±35
Bond Pad Gap (μm)	60	±15
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 flux eutectic 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. The ESD classification of Class 2 is based on sampling 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 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 are based on a thru-hole package (with Hysol OS4000 encapsulant and flux eutectic die attach). Optical characteristics are measured in an integrating sphere using Illuminance E.
4. The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end-product to be designed in a manner that minimizes the thermal resistance from the LED junction to ambient in order to optimize product performance.



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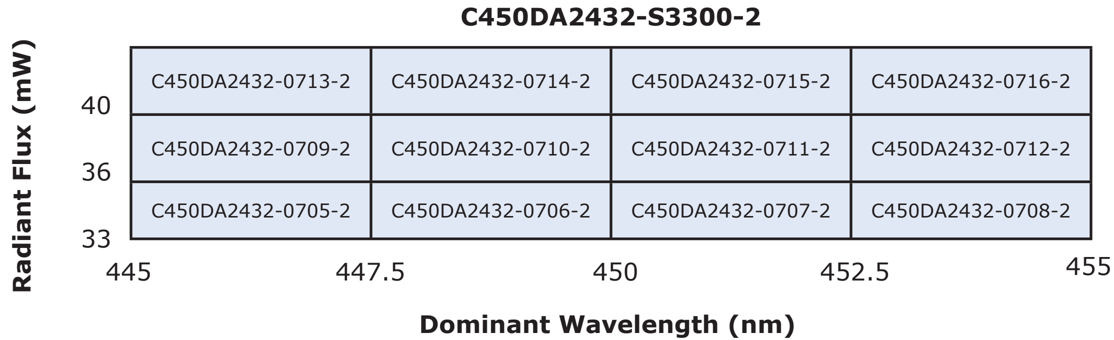
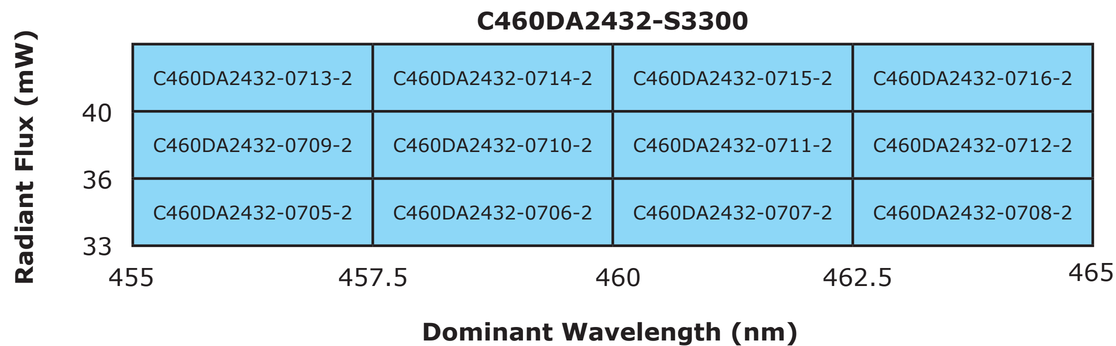
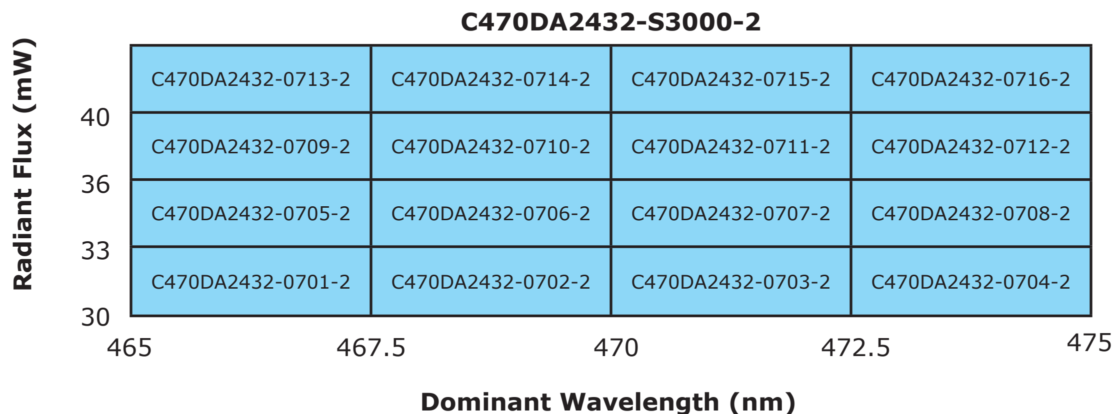
Standard Bins for C*xxx*DA2432-S*xxx*00-2

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*DA2432-S*xxxxx*-*2*) orders may be filled with any or all bins (C*xxx*DA2432-*xxxxx*-*2*) contained in the kit. All radiant flux and dominant wavelength values shown and specified are at If = 20 mA.







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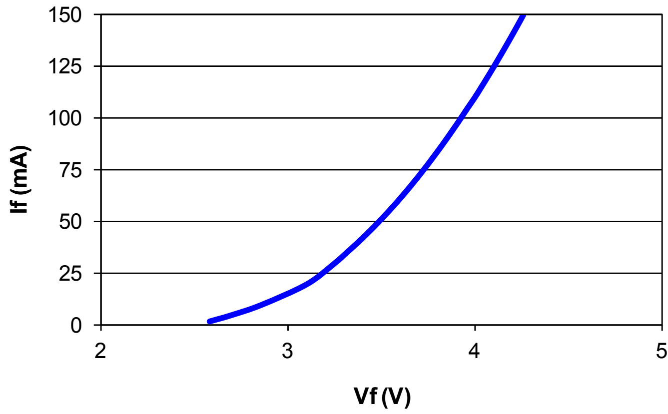
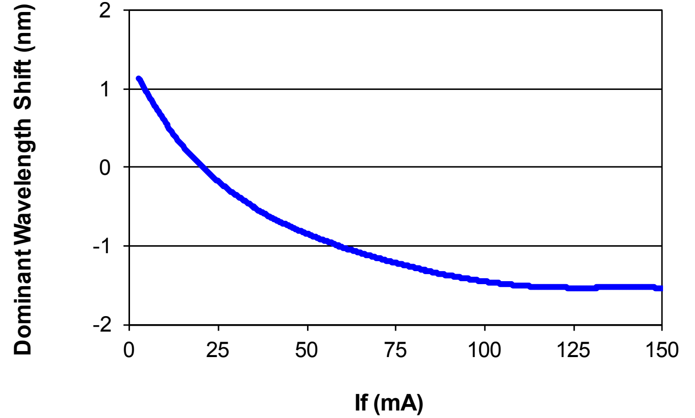
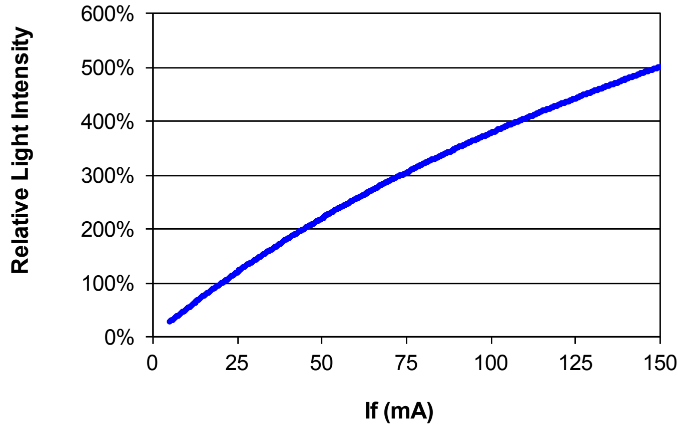
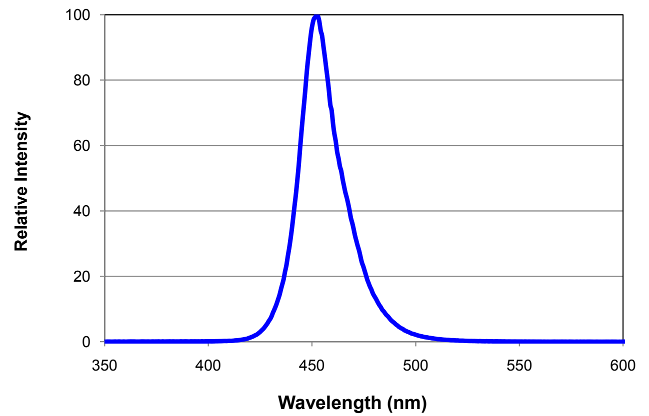
Characteristic Curves

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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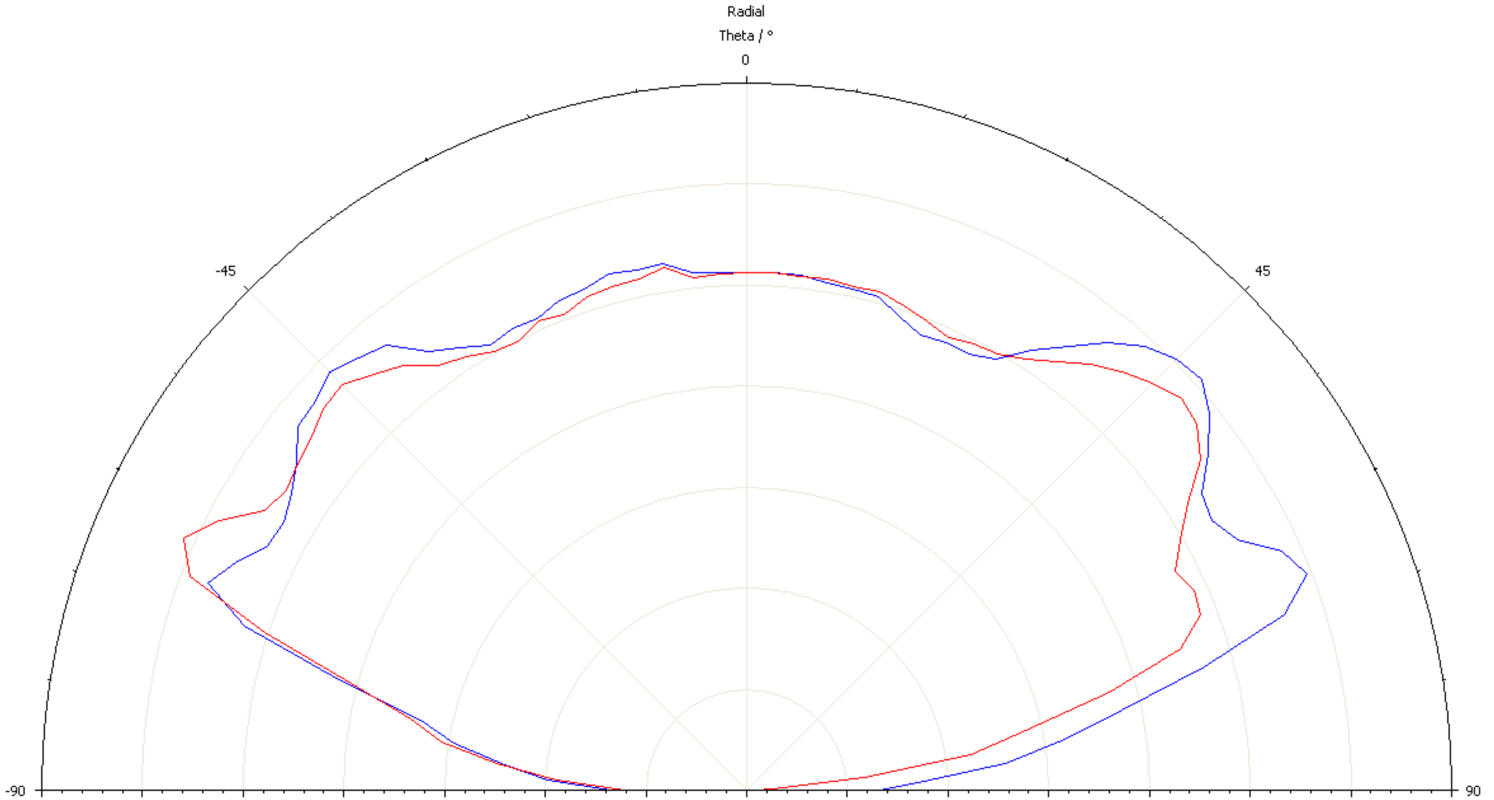
Radiation Pattern

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



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