RazerThin® LEDs
CxxxRT290-S0100

Cree's RazerThin LEDs are a new generation of solid-state LED emitters that combine highly efficient InGaN materials with Cree's proprietary G•SiC® substrate to deliver superior price/performance for high-intensity blue and green LEDs. These vertically structured LED chips are approximately 95 microns in height and require a low forward voltage. Cree's RazerThin series chips have the ability to withstand 1000V ESD. Applications for RazerThin LEDs include next-generation keypad backlighting where sub-miniaturization and thinner form factors are required.

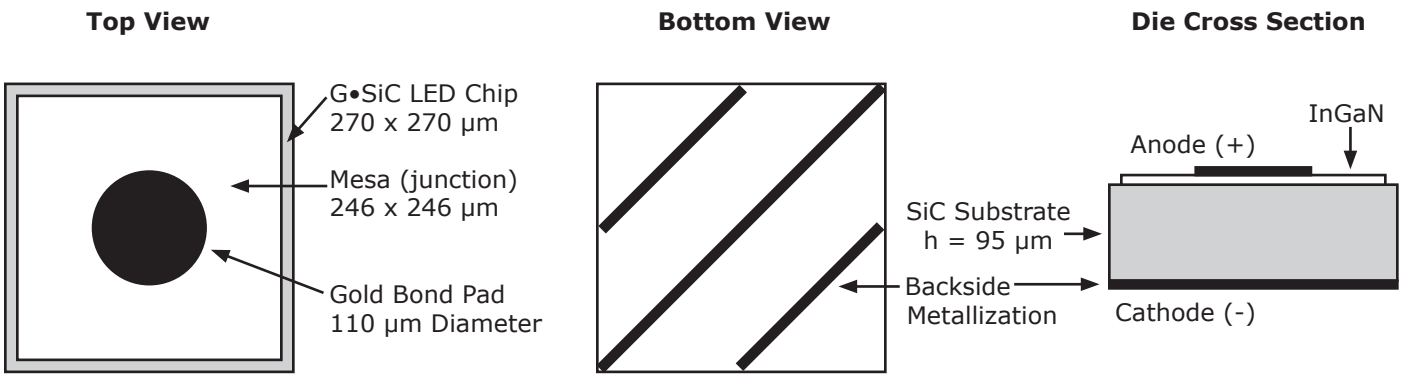
FEATURES

- Thin 95 µm Chip
- Reduced Forward Voltage
  - 2.9V Typical at 5 mA
- RazerThin LED Performance
  - 460nm - 3.8-11.1 mW
  - 470nm - 3.4-10.4 mW
  - 527nm - 1.7-6.0 mW
- Single Wire Bond Structure
- Class 2 ESD Rating

APPLICATIONS

- Mobile Phone Key Pads
  - White LEDs
  - Blue LEDs
  - Green LEDs
- Cellular Phone LCD Backlighting
- Digital Camera Flash for Mobile Appliance
- Automotive Dashboard Lighting
- LED Video Displays
- Audio Product Display Lighting

CxxxRT290-S0100 Chip Diagram



Maximum Ratings at T_A = 25°C Notes 1&3	CxxxRT290-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	-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 = 5mA Note 3

Part Number	Forward Voltage (V_f, V)			Reverse Current [I(Vr=5V), µA]
	Min.	Typ.	Max.	Max.
C460RT290-S0100	2.7	2.9	3.1	1
C470RT290-S0100	2.7	2.9	3.1	1
C527RT290-S0100	2.6	2.9	3.2	1

Mechanical Specifications	CxxxRT290-S0100	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	246 x 246	± 25
Top Area (µm)	270 x 270	± 25
Bottom Area (µm)	270 x 270	± 25
Chip Thickness (µm)	95	± 15
Au Bond Pad Diameter (µm)	110	± 20
Au Bond Pad Thickness (µm)	1.2	± 0.5
Back Contact Metal Width (µm)	20	± 10

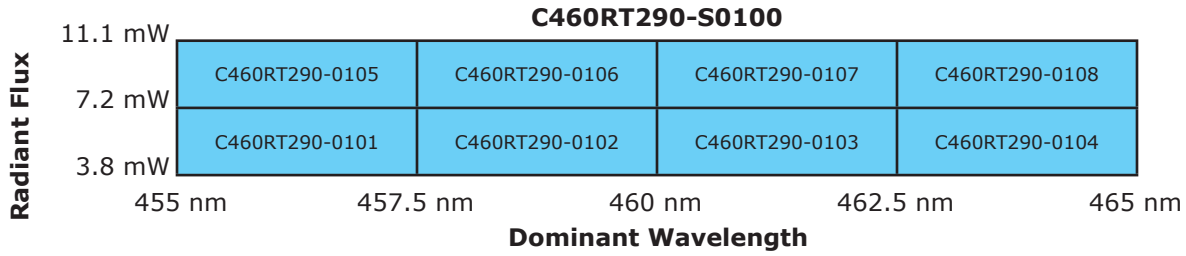
Notes:

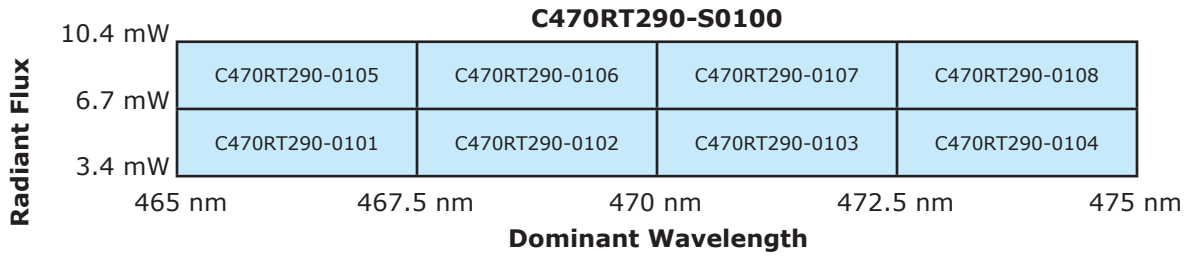
1. Maximum ratings are package dependent. The above ratings were determined using a T-1 3/4 package (with Hysol OS4000 epoxy) for characterization. Seller makes no representations regarding ratings for packages other than the T-1 3/4 package used by Seller. The forward currents (DC and Peak) are not 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 5 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 OS4000 epoxy). Dominant wavelength measurements taken using Illuminance E.
4. For reference only, typical V_f for C460, C470, and C527 is 3.2 V and at 20 mA.

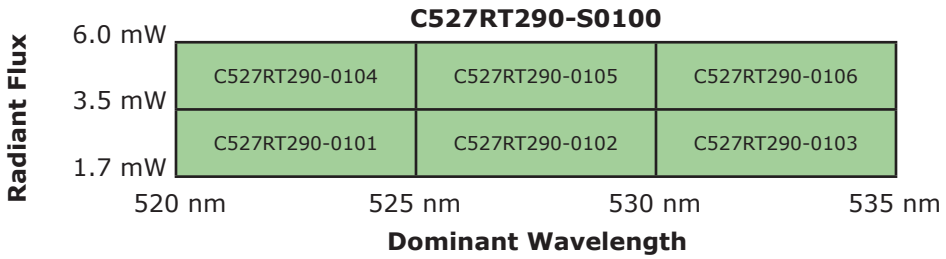
Cree, Inc.
4600 Silicon Drive
Durham, NC 27703
USA Tel: +1.919.313.5300
www.cree.com

Standard Bins for RT290

All LED chips are sorted onto die sheets according to the bins shown below. All radiant flux values shown and specified are at If = 20 mA (see Note 1) and all dominant wavelength values shown and specified are at If = 5 mA (see Note 2).







Notes:

1. For reference only, radiant flux values at If = 5 mA are typically 29% and 32% of the corresponding radiant flux at If = 20 mA for 455-475 nm range and 520-535 nm range, respectively.
2. For reference only, wavelength values at If = 20 mA are typically 2 nm less and 7 nm less than the corresponding wavelength values at If = 5 mA for 455-475 nm range and 520-535 nm range, respectively.
3. Sorted die dits may contain any or all of the bins shown above, respectively.

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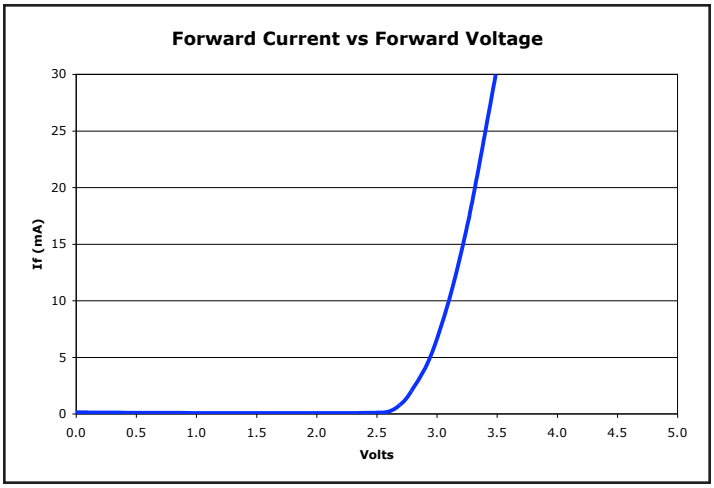
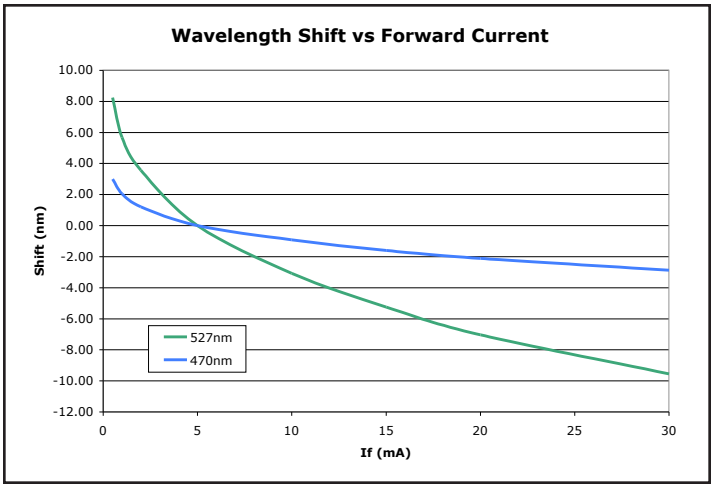
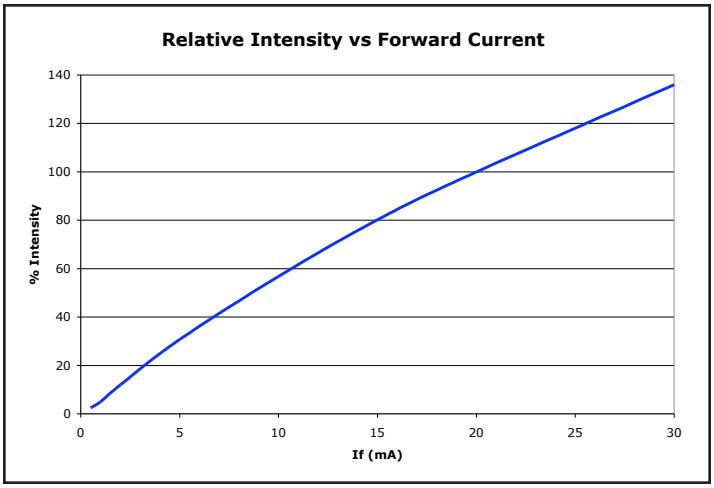
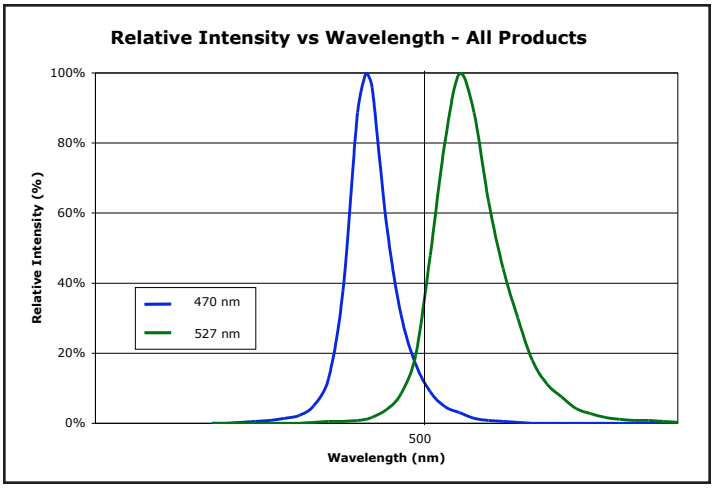
Characteristic Curves

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









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