CREE OPTOELECTRONICS

G·SiC® Technology
RazerThin™ LEDs
C*xxx*RT290-S0100

Features

- Thin 95µm Chip
- Reduced Forward Voltage
  – 2.9V Typical at 5mA
- High Performance
- Single Wire Bond Structure
- Class II ESD Rating

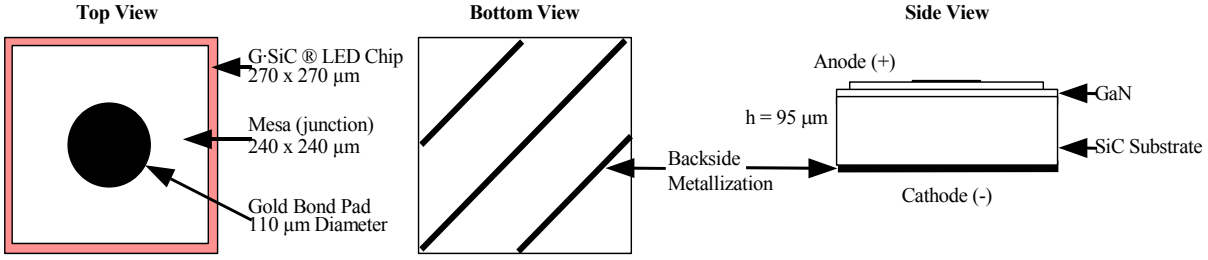
Applications

- 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

Description

Cree's RazerThin™ LEDs are a new generation of solid state LED emitters which combine highly efficient InGaN materials with Cree's proprietary 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 include next generation keypad backlighting where sub-miniaturization and thinner form factors are required.

C*xxx*RT290-S0100 Chip Diagram



CPR3BU Rev. B

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Maximum Ratings at T_A = 25°C Notes 1&3	**C*xxx*RT290-S0100**
DC Forward Current	30mA
Peak Forward Current (1/10 duty cycle @ 1kHz)	100mA
LED Junction Temperature	125°C
Reverse Voltage	5 V
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-40°C to +100°C
Electrostatic Discharge Threshold (HBM) Note 2	1000V
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]
	Min	Typ Note 4	Max	Max
C460RT290-S0100 C470RT290-S0100	2.7	2.9	3.1	10
C527RT290-S0100	2.6	2.9	3.2	10

Mechanical Specifications	**C*xxx*RT290-S0100**	
Description	**Dimension**	**Tolerance**
P-N Junction Area (µm)	240 x 240	± 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 3.2V and at 20mA.

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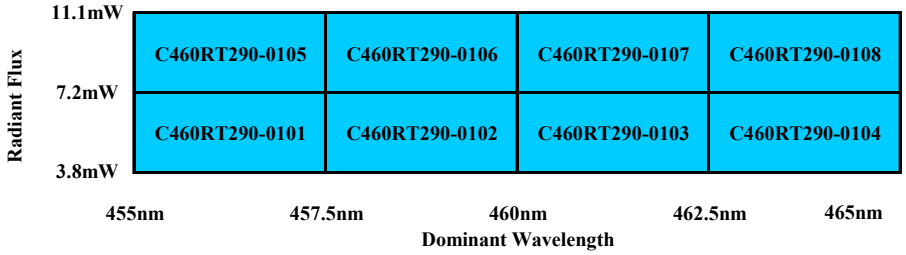
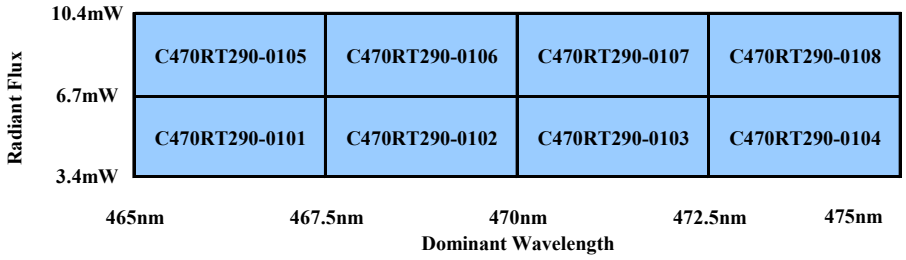
Standard Bins for RT290:

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



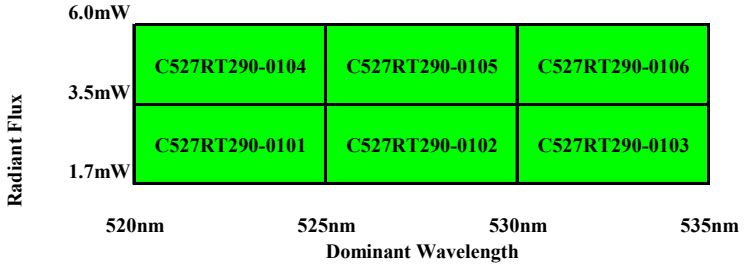
C460RT290-S0100

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



C470RT290-S0100

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



C527RT290-S0100

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

Notes:

1) For reference only, radiant flux values at If = 5mA are typically 29% and 32% of the corresponding radiant flux at If = 20mA for 455-475nm range and 520-535nm range, respectively.

2) For reference only, wavelength values at If = 20mA are typically 2nm less and 7nm less than the corresponding wavelength values at If=5mA for 455-475nm range and 520-535nm range, 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.