

BLUE POWER DIE

BXCE 33 mil x 33 mil

PRODUCT DATA SHEET DS-C16

The Bridgelux family of blue power die enables high performance and cost effective solutions to serve solid state lighting market. This next generation chip technology delivers improved efficiency and performance to enable increased light output for a variety of lighting, signaling and display applications.

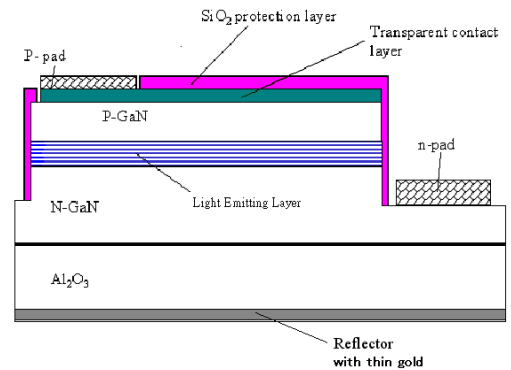
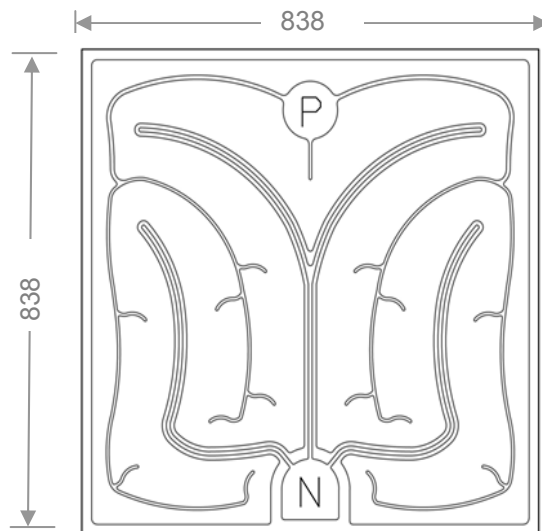
Features

- High lumen output and efficiency
- Long operating life
- 100% Tested and sorted by wavelength, power and forward voltage
- Lambertian emission pattern
- Compatible with Solder paste, solder preform or silver epoxy die attach
- Delivered on medium tack blue tape (20cm±10mm x20 cm±10mm)

Applications

- General Illumination
- Portable Lighting
- Architectural Lighting
- Directional Lighting
- Display Backlighting
- Digital Camera Flash
- Automotive Lighting
- White LEDs

LED CHIP DIAGRAM



The Magic of Light™

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Mechanical Dimensions

Chip size	838(-10/ +30) μm \times 838(-10/ +30) μm
Wafer thickness	150 \pm 10 μm
Pad Thickness	4.3 \pm 0.4 μm
Pad diameter	P: 100 μm / N: 105 μm

Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating	Condition
Forward DC Current	I_f	450 ¹	$T_j=140^\circ\text{C}$
Peak Pulsed Forward Current		550 mA ²	$T_j = 65^\circ\text{C}$
Forward Voltage	V_f	3.8 V	$I_f = 350 \text{ mA}$
Reverse voltage	V_r	-5V	$T_a=25^\circ\text{C}$
Reverse Current	V_r	2.0 μA	$V_r = -5 \text{ V}$
Junction Temperature	T_j	150 $^\circ\text{C}$	
Assembly Process Temp.		325 $^\circ\text{C}$ for <5 seconds	
Storage Conditions (chip on tape)		0 $^\circ\text{C}$ to +40 $^\circ\text{C}$ ambient, RH < 65%	

Notes:

1. Maximum drive current depends on junction temperature, die attach methods/materials, and lifetime requirements of the application.
2. Peak forward current is specified at 65 $^\circ\text{C}$ junction temperature using a 400 ms pulse at 20% duty cycle.
3. Bridgelux LED chips are Class 1 ESD sensitive.
4. The typical spectra half-width of the BXCE3333 blue power die is < 25 nm.
5. Please consult the Bridgelux technical support team for information on how to optimize the light output of our chips in your package.
6. Brightness values are measured in an integrating sphere using gold plated TO39 headers without encapsulation.
7. Tapes should be stored in a vertical orientation, not horizontally stacked. Stacking of tapes can place excessive pressure on the bond pads of the LED, resulting in reduced wire bonding strength.

Environmental Compliance

Bridgelux is committed to providing environmentally friendly products to the solid state lighting market. Bridgelux BXCE3333 blue power die are compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS directive. Bridgelux will not intentionally add the following restricted materials to BXCE3333 die products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

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Part Numbering and Bin Definitions

Bridgelux LED chips are sorted into the brightness and dominant wavelength bins shown below at $I_f = 350$ mA. Each blue tape contains die from only one brightness bin and one wavelength bin.

The forward voltage is 3.2-3.4, 3.4-3.6, 3.6-3.8 V and the maximum forward voltage ($V_f \text{ max}$) = 3.8 V.

Dominant Wavelength	Power Bin D1 (255 – 275 mW)	Power Bin D2 (275 – 295 mW)	Power Bin E1 (295 – 320 mW)
445 to 447.5nm	BXCE3333445-D1-z	BXCE3333445-D2-z	BXCE3333445-E1-z
447.5 to 450nm	BXCE3333447-D1-z	BXCE3333447-D2-z	BXCE3333447-E1-z
450 to 452.5nm	BXCE3333450-D1-z	BXCE3333450-D2-z	BXCE3333450-E1-z
452.5 to 455nm	BXCE3333452-D1-z	BXCE3333452-D2-z	BXCE3333452-E1-z
455 to 457.5nm	BXCE3333455-D1-z	BXCE3333455-D2-z	BXCE3333455-E1-z
457.5 to 460nm	BXCE3333457-D1-z	BXCE3333457-D2-z	BXCE3333457-E1-z
460 to 462.5nm	BXCE4333460-D1-z	BXCE3333460-D2-z	BXCE3333460-E1-z
462.5 to 465nm	BXCE3333462-D1-z	BXCE3333462-D2-z	BXCE3333462-E1-z

Dominant Wavelength	Power Bin E2 (320 – 340 mW)	Power Bin F1 (340 – 360 mW)
445 to 447.5nm	BXCE3333445-E2-z	BXCE3333445- F1-z
447.5 to 450nm	BXCE3333447-E2-z	BXCE3333447- F1-z
450 to 452.5nm	BXCE3333450-E2-z	BXCE3333450- F1-z
452.5 to 455nm	BXCE3333452-E2-z	BXCE3333452- F1-z
455 to 457.5nm	BXCE3333455-E2-z	BXCE3333455- F1-z
457.5 to 460nm	BXCE3333457-E2-z	BXCE3333457- F1-z
460 to 462.5nm	BXCE3333460-E2-z	BXCE3333460- F1-z
462.5 to 465nm	BXCE3333462-E2-z	BXCE3333462- F1-z

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Product Nomenclature

B X C E 3333 XXX - Y - Z

Where:

- BXCE: Designates product family
- 3333: Designates die size (50 mil x 50 mil)
- XXX: Designates dominant wavelength bin
- Y: Designates radiometric power bin
- Z: Designates forward voltage bin

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Performance vs. Current

The following curves represent typical performance of the BXCE3333 blue power die. Actual performance will vary slightly for different power and dominant wavelength bins.

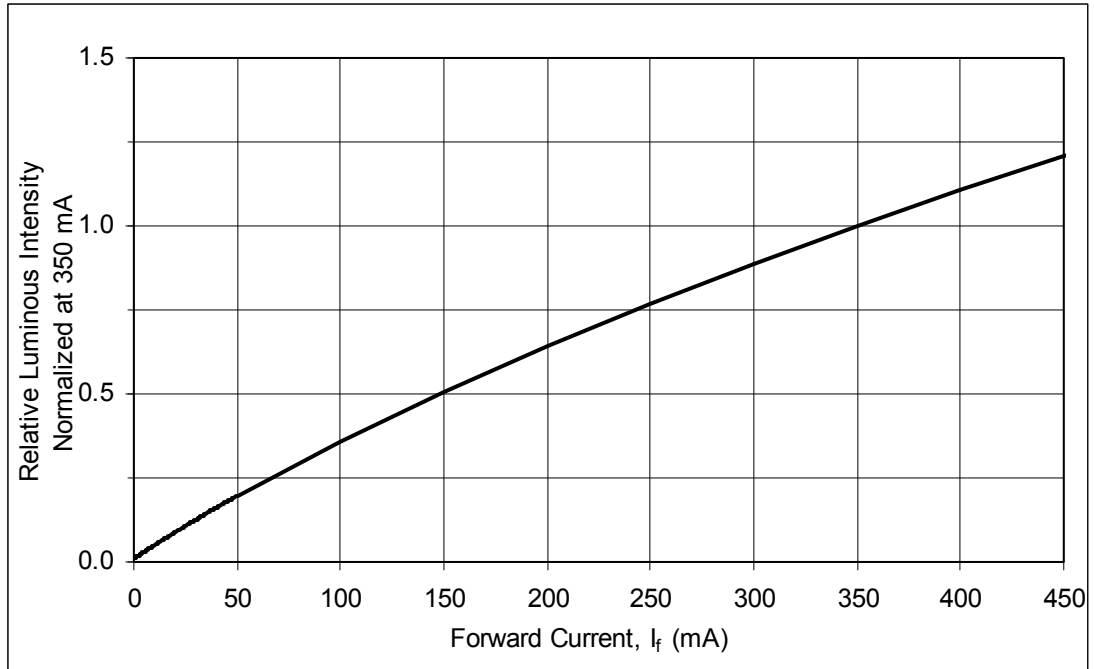


Figure 1: Relative Luminous Intensity vs. Forward Current (device tested on a probe station)

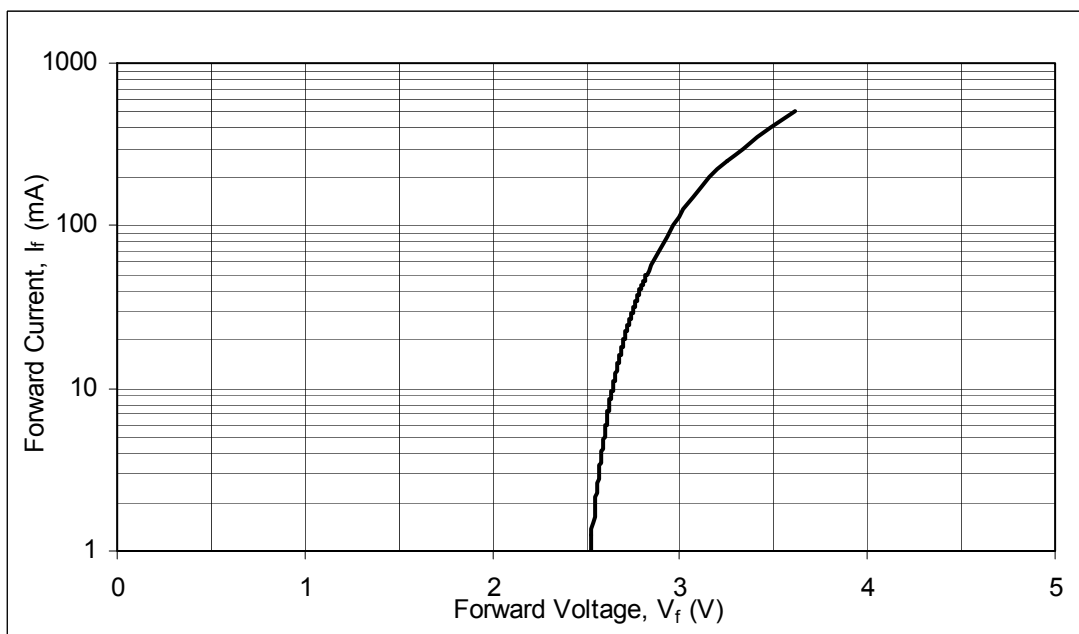


Figure 2: Forward Current vs. Forward Voltage ($T_j = 25^\circ\text{C}$)

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Performance vs. Junction Temperature

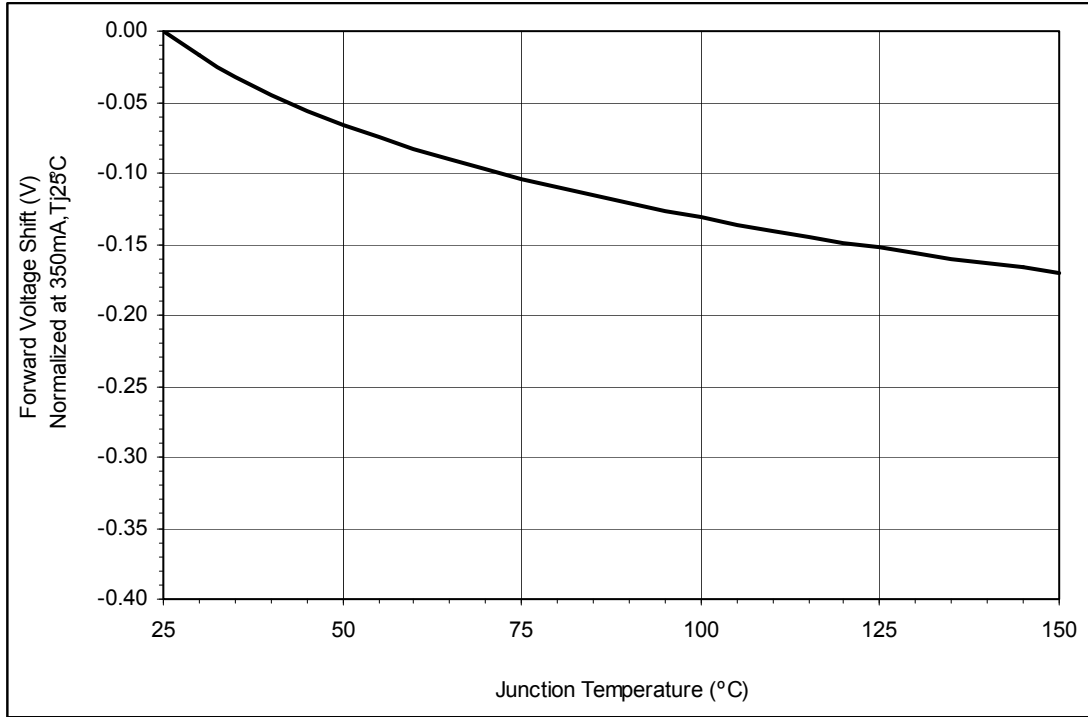


Figure 3: Forward Voltage Shift versus Junction Temperature

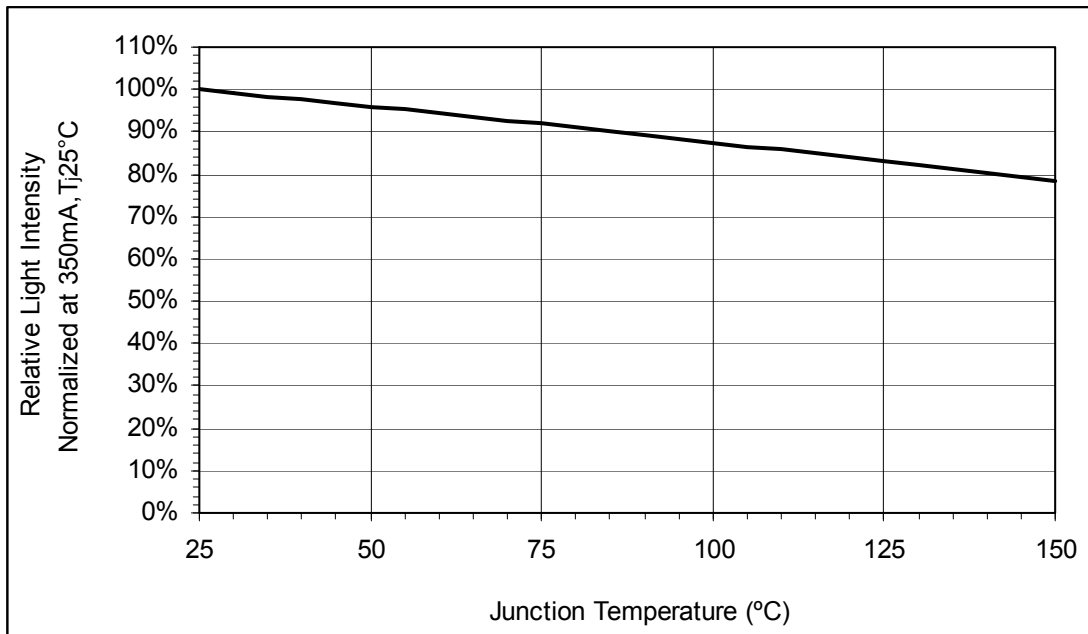


Figure 4: Relative Light Intensity versus Junction Temperature

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Wavelength Shift

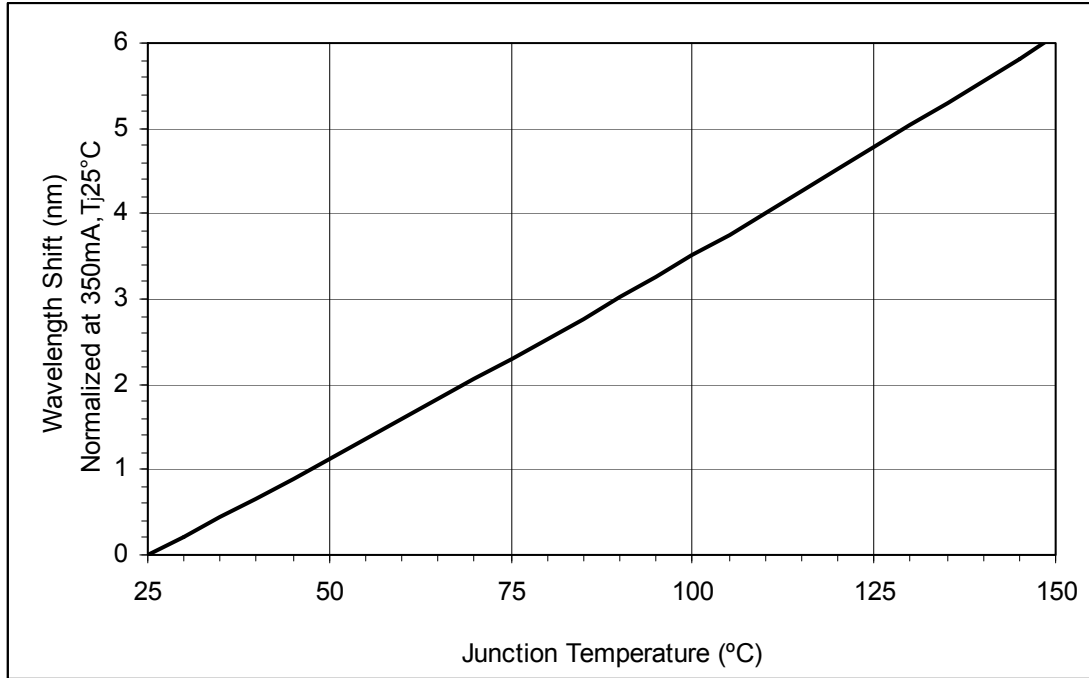


Figure 5: Wavelength Shift versus Junction Temperature

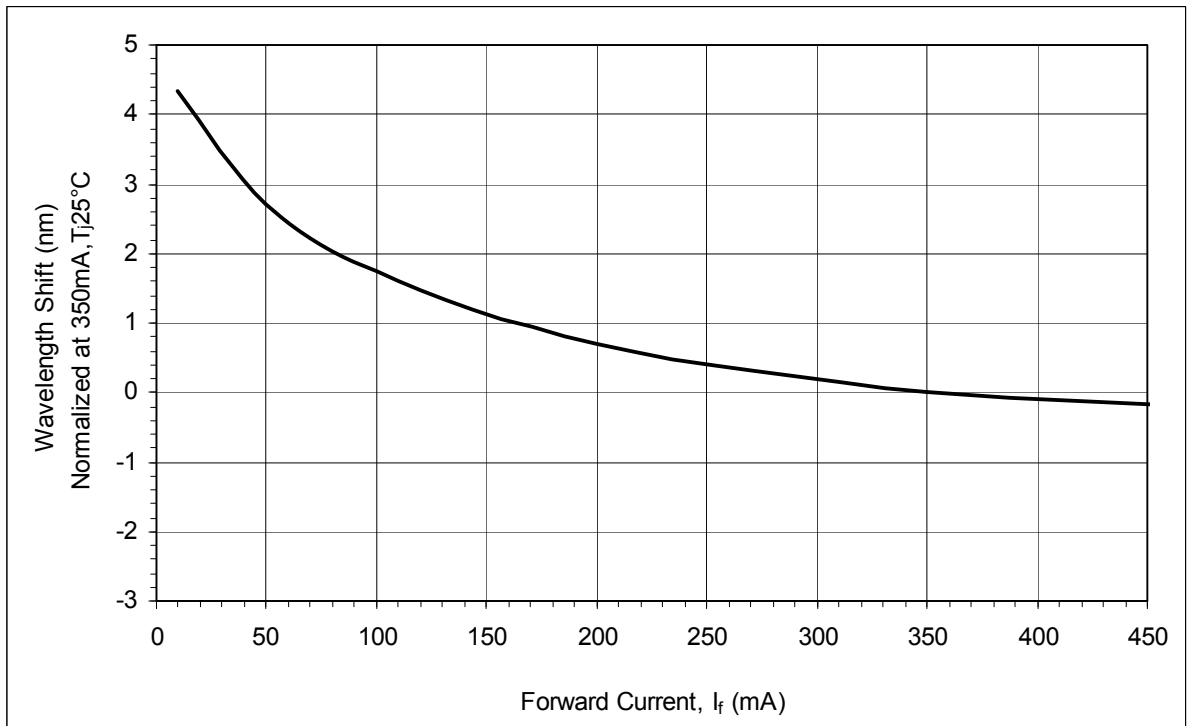


Figure 6: Wavelength Shift versus Junction Forward Current

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Typical Radiation Pattern

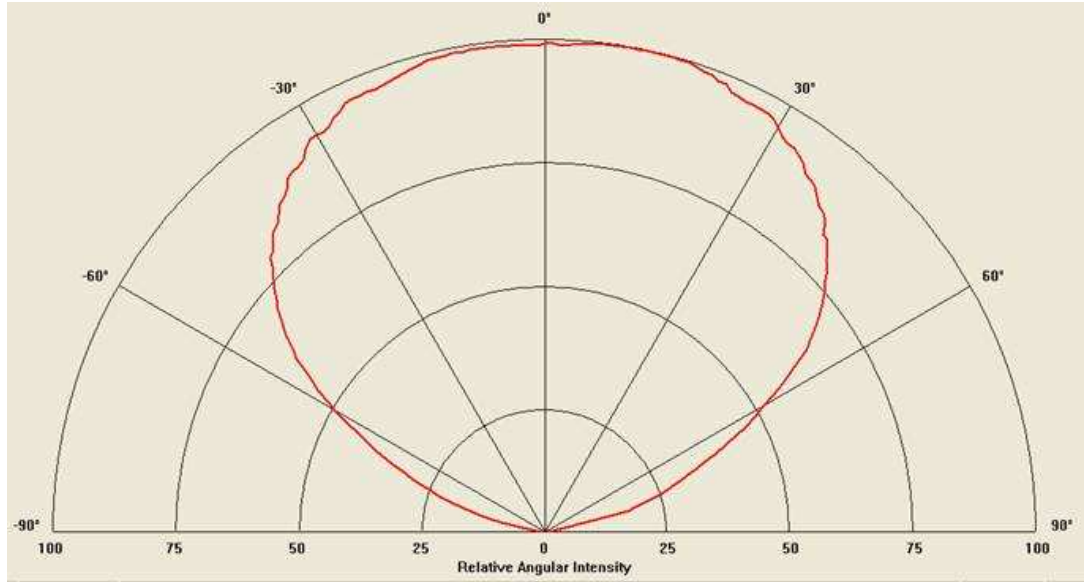


Figure 7: Typical Radiation Pattern (350 mA Operation)

Current De-rating Curves

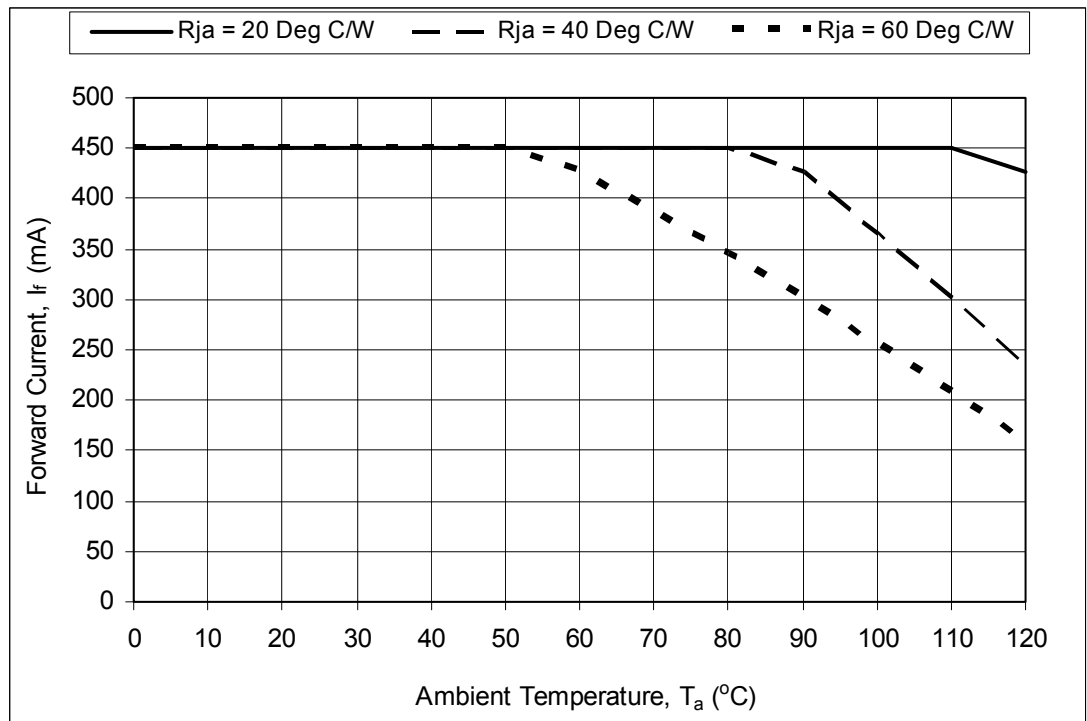


Figure 8: Current Derating Curve vs. Ambient Temperature (derating based on T_j max 150°C)

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About Bridgelux

Bridgelux is a leading developer and manufacturer of technologies and solutions transforming the \$40 billion global lighting industry into a \$100 billion market opportunity. Based in Livermore, California, Bridgelux is a pioneer in solid-state lighting (SSL), expanding the market for light-emitting diode (LED) technologies by driving down the cost of LED lighting systems. Bridgelux's patented light source technology replaces traditional technologies (such as incandescent, halogen, fluorescent and high intensity discharge lighting) with integrated, solid-state lighting solutions that enable lamp and luminaire manufacturers to provide high performance and energy-efficient white light for the rapidly growing interior and exterior lighting markets, including street lights, commercial lighting and consumer applications. With more than 650 patent applications filed or granted worldwide, Bridgelux is the only vertically integrated LED manufacturer and developer of solid-state light sources that designs its solutions specifically for the lighting industry.

For more information about the company, please visit www.bridgelux.com

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