BRIDGELUX BLUE POWER DIE

BXFD 45 x 45

PRODUCT DATA SHEET DS-C21

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.

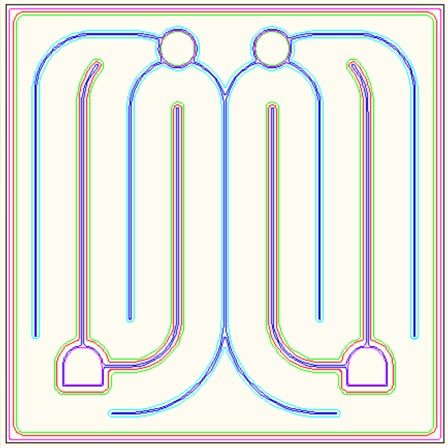
Features

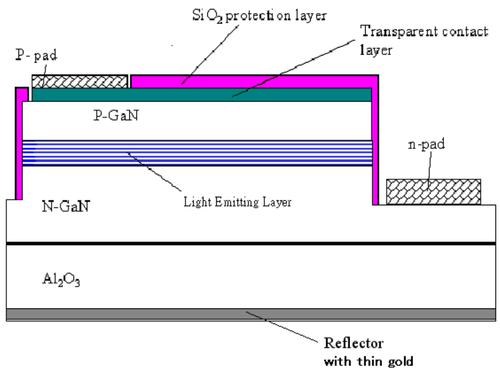
- High lumen output and efficiency
- Long operating life
- Increased current spreading traces for highly efficient and uniform illumination
- 100% Tested and sorted by wavelength, power and forward voltage
- Lambertian emission pattern
- Compatible with Solder paste, solder preform or silver epoxy die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

Applications

- General Illumination
- Street Lights
- Portable Lighting
- Architectural Lighting
- Directional Lighting
- Wide Area Lighting
- Display Backlighting
- Digital Camera Flash
- Automotive Lighting
- White LED

LED Chip Diagram





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BXFD 45 x 45

Product Nomenclature

B X F D 4 5 4 5 X X X – Y Y – Z

Where:

BXFD: Designates product family

4545: Designates die size (45 mil x 45 mil)

XXX: Designates dominant wavelength bin

YY: Designates radiometric power bin

Z: Designates forward voltage bin

Part Numbering and Bin Definitions

Bridgelux LED chips are sorted into brightness, dominant wavelength, and forward voltage bins shown below at I_f = 350 mA. Each blue tape contains chips from one single bin only.

The forward voltage bins are set up as: 3.0 - 3.1 V, 3.1 - 3.2 V, 3.2 - 3.3 V and 3.3 - 3.4 V. The maximum forward voltage (V_f max) = 3.4 V.

Dominant Wavelength	Power Bin F2 (360 – 380 mW)	Power Bin G1 (380 – 400 mW)	Power Bin G2 (400 – 420 mW)
445 to 447.5nm	BXFD4545445- F2-z	BXFD4545445- G1-z	BXFD4545445- G2-z
447.5 to 450nm	BXFD4545447- F2-z	BXFD4545447- G1-z	BXFD4545447- G2-z
450 to 452.5nm	BXFD4545450- F2-z	BXFD4545450- G1-z	BXFD4545450- G2-z
452.5 to 455nm	BXFD4545452- F2-z	BXFD4545452- G1-z	BXFD4545452- G2-z
455 to 457.5nm	BXFD4545455- F2-z	BXFD4545455- G1-z	BXFD4545455- G2-z
457.5 to 460nm	BXFD4545457- F2-z	BXFD4545457- G1-z	BXFD4545457- G2-z
460 to 462.5nm	BXFD4545460- F2-z	BXFD4545460- G1-z	BXFD4545460- G2-z
462.5 to 465nm	BXFD4545462- F2-z	BXFD4545462- G1-z	BXFD4545462- G2-z

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Dominant Wavelength	Power Bin H1 (420 - 440 mW)	Power Bin H2 (440 - 460 mW)	Power Bin J1 (460 - 480 mW)
445 to 447.5nm	BXFD4545445- H1-z	BXFD4545445- H2-z	BXFD4545445- J1-z
447.5 to 450nm	BXFD4545447- H1-z	BXFD4545447- H2-z	BXFD4545447- J1-z
450 to 452.5nm	BXFD4545450- H1-z	BXFD4545450- H2-z	BXFD4545450- J1-z
452.5 to 455nm	BXFD4545452- H1-z	BXFD4545452- H2-z	BXFD4545452- J1-z
455 to 457.5nm	BXFD4545455- H1-z	BXFD4545455- H2-z	BXFD4545455- J1-z
457.5 to 460nm	BXFD4545457- H1-z	BXFD4545457- H2-z	BXFD4545457- J1-z
460 to 462.5nm	BXFD4545460- H1-z	BXFD4545460- H2-z	BXFD4545460- J1-z
462.5 to 465nm	BXFD4545462- H1-z	BXFD4545462- H2-z	BXFD4545462- J1-z

Note: z = “A” for Vf bin of 3.0-3.2V; z = “B1” for Vf bin of 3.2-3.3V; z = “B2” for Vf bin of 3.3-3.4V

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Mechanical Dimensions

Chip Size	1143 +30/-15 µm × 1143 +30/-15 µm (45 mil x 45 mil)
Chip Thickness	150 ± 10 µm (5.9 mil)
Au Pad Thickness	3.6 ± 0.3 µm
Au Pad Diameter	P Pad (2X): 100 µm N Pad (2X): 105 µm

Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating	Condition
DC Forward Current	I_f	700 mA[1]	T_j = 140°C
Forward Voltage	V_f	3.4 V	I_f = 350 mA
Junction Temperature	T_j	150°C	
Reverse Voltage	V_r	-5 V	T_a = 25°C
Reverse Current	I_r	1.0 µA	V_r = -5 V
Optical Power (minimum)	P_0	340 mW	I_f = 350 mA
Assembly Process Temperature	325°C for < 5 seconds		
Storage Conditions (chip on tape)[6]	0°C to +40°C ambient, RH < 65%		

Notes:

1. *Maximum drive current depends on junction temperature, die attach methods/materials, and lifetime requirements of the application.*
2. *Bridgelux LED chips are Class 1 ESD sensitive.*
3. *The typical spectra half-width of the BXFD4545 blue power die is < 25 nm.*
4. *Please consult the Bridgelux technical support team for information on how to optimize the light output of our chips in your package.*
5. *Brightness values are measured in an integrating sphere using gold plated TO39 headers without encapsulation.*
6. *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 BXFD4545 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 BXFD4545 die products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

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Performance vs. Current

The following curves represent typical performance of the BXFD4545 blue power die. Actual performance will vary slightly for different power and dominant wavelength bins.

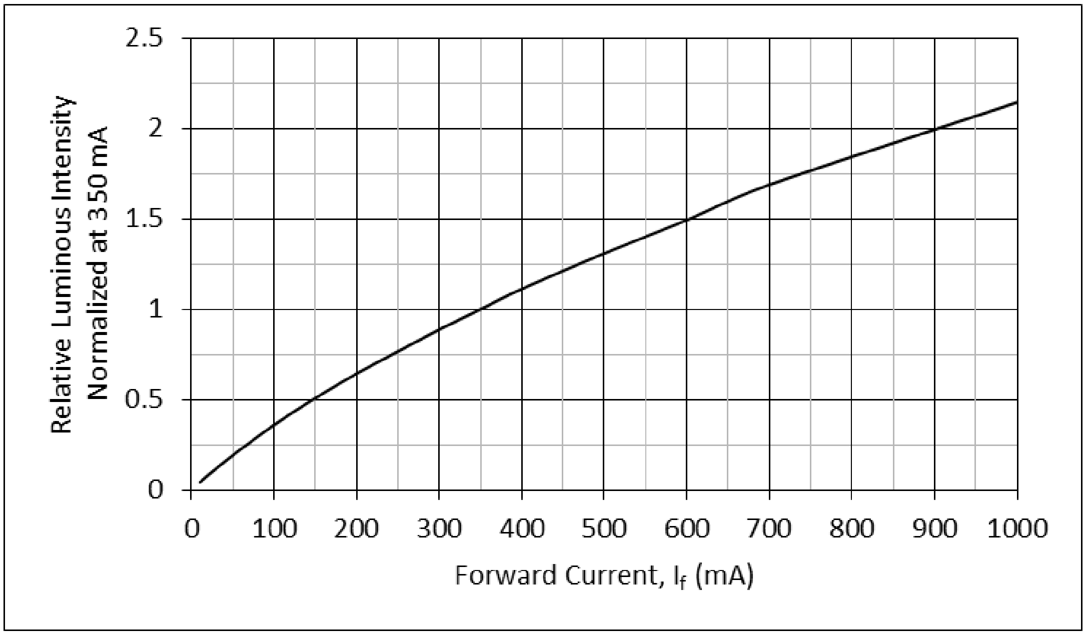

Figure 1: Relative Luminous Intensity vs. Forward Current (tested on AuTO)

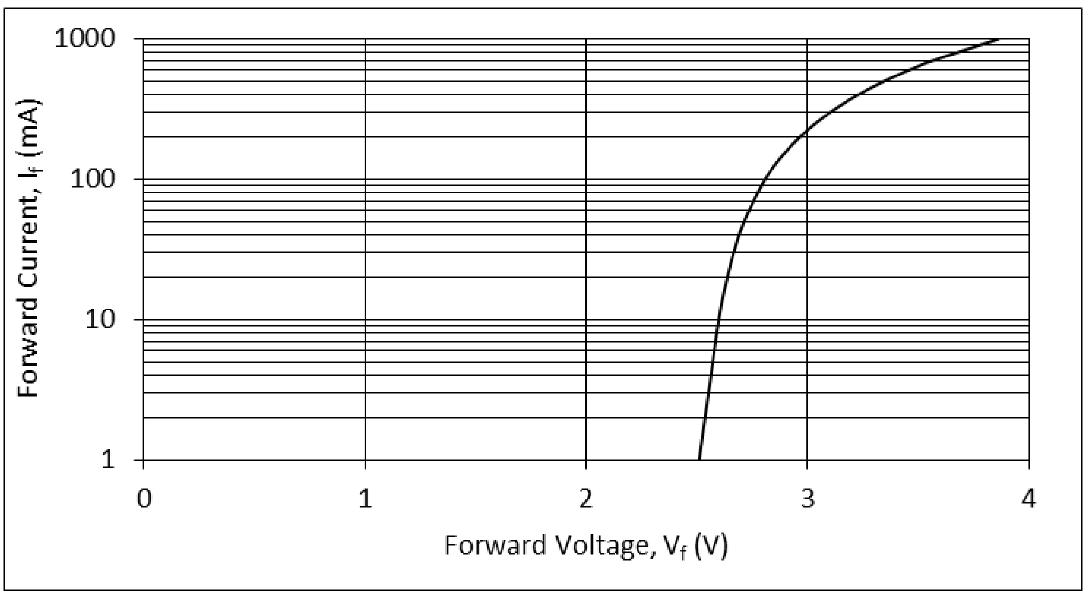

Figure 2: Forward Current vs. Forward Voltage (T_j = 25°C) (tested on AuTO)

Performance vs. Junction Temperature

The following curves represent typical performance of the BXFD4545 blue power die. Actual performance will vary slightly for different power and dominant wavelength bins.

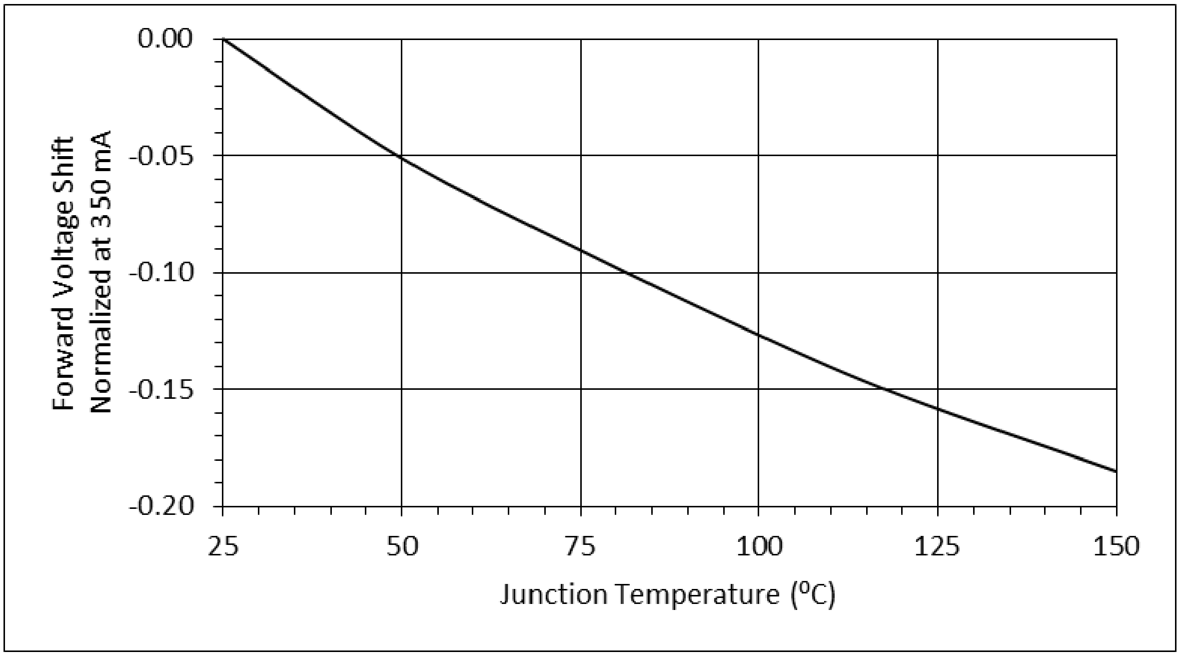

Figure 3: Forward Voltage vs. Junction Temperature

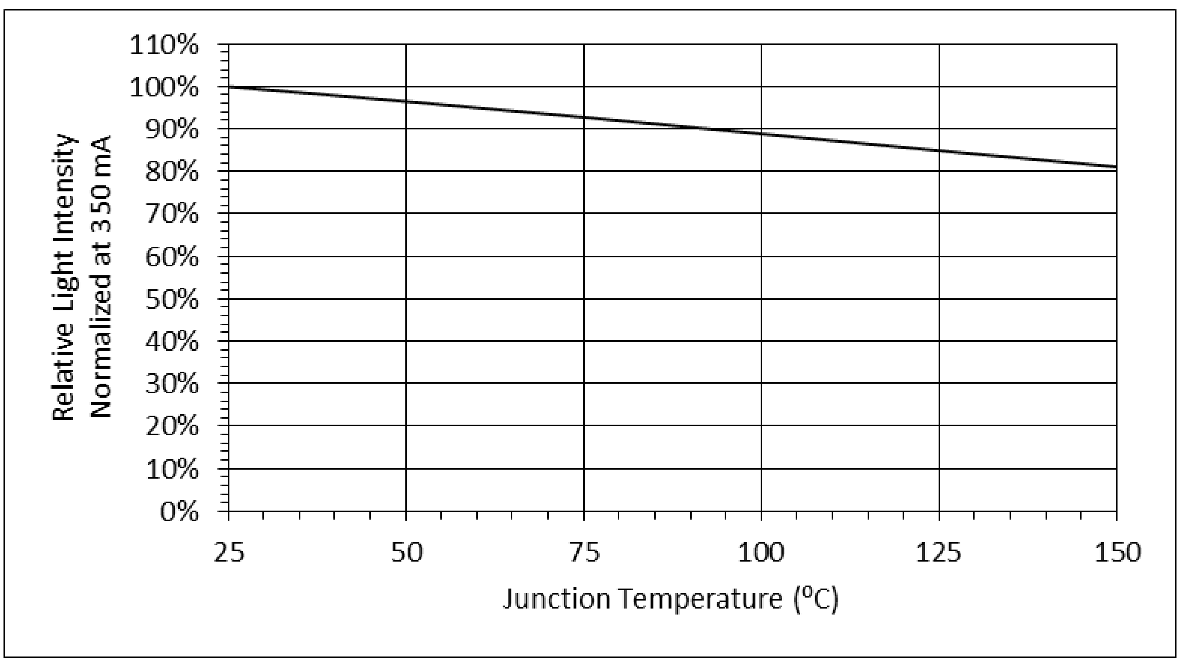

Figure 4: Relative Light Output vs. Junction Temperature

Wavelength Shift

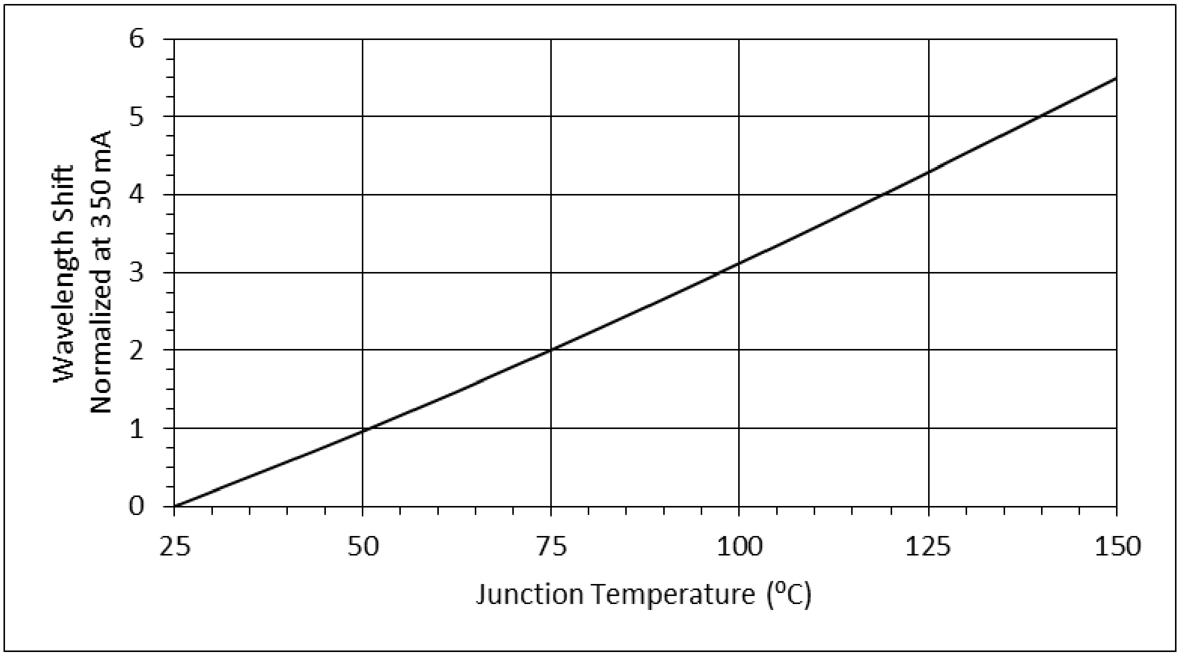

Figure 5: Wavelength Shift vs. Junction Temperature

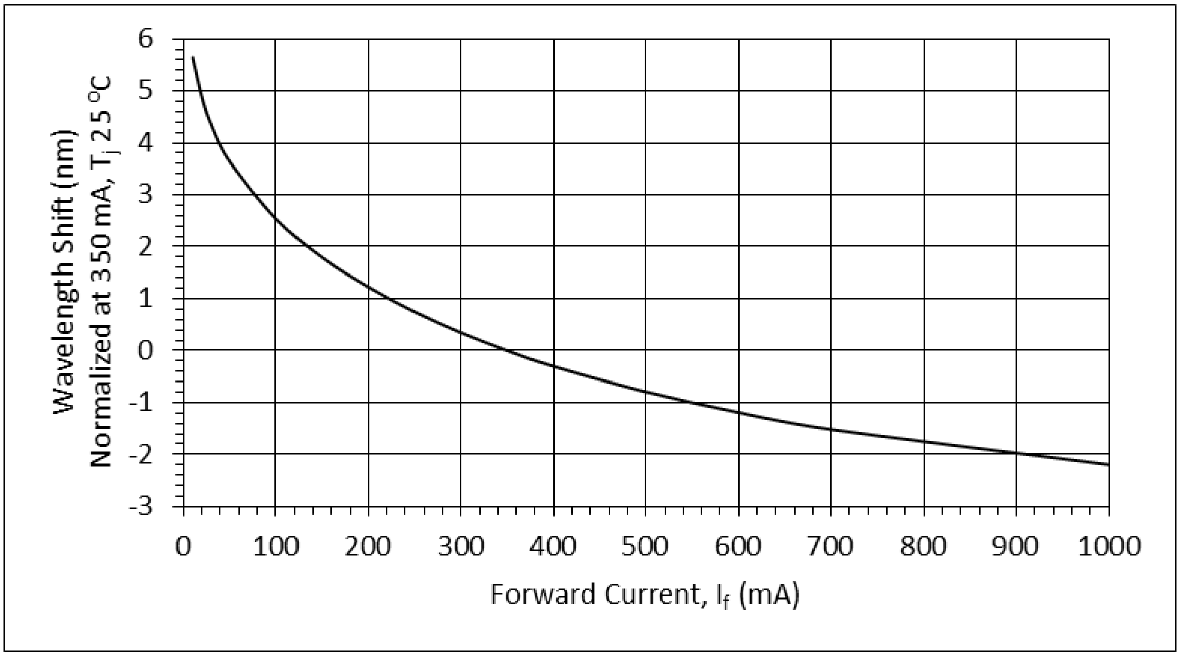

Figure 6: Wavelength Shift vs. Forward Current

Typical Radiation Pattern

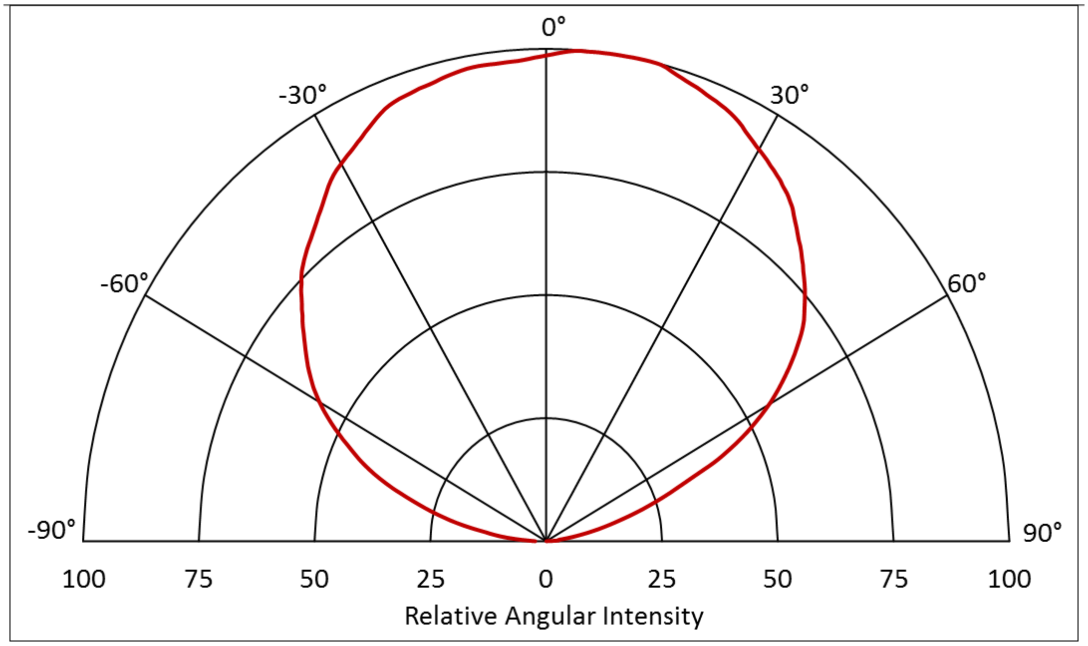

Figure 7: Typical Radiation Pattern (120mA Operation)

Current De-rating Curves

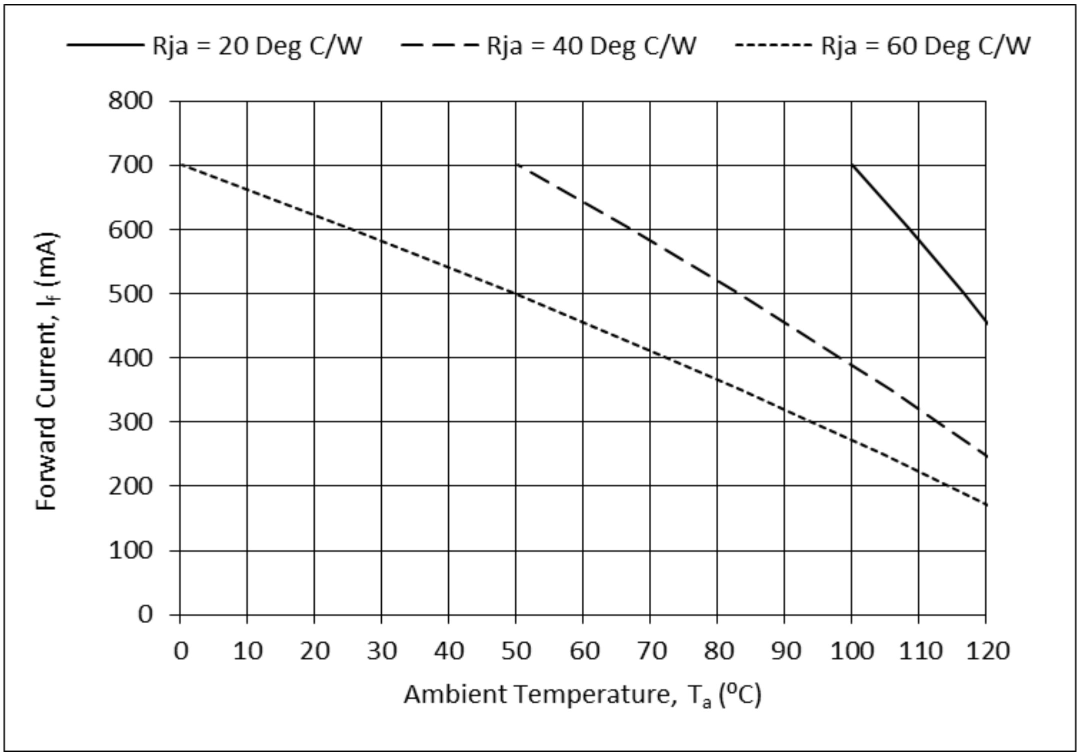

Figure 8: Current De-rating Curve vs. Ambient Temperature (derating based on T_j max 150°C)

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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