BRIDGELUX BLUE POWER DIE

BXDB 40 mil x 40 mil

PRODUCT DATA SHEET DS-C29

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

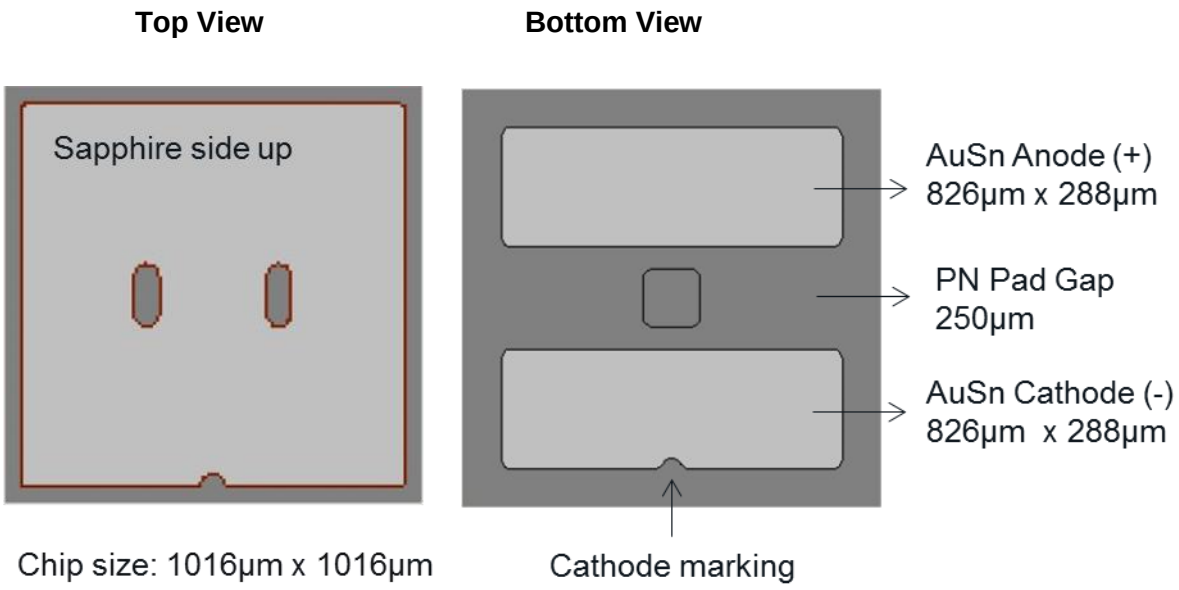
Features

- Latest flip chip technology
- Allows for direct die attach
- AuSn metal pad
- High drive current
- Low thermal resistance
- Low typical forward voltage
- Long operating life
- 450-460nm wavelength range

Applications

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

LED Chip Diagram



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Product Nomenclature

B X D B 4040 X X X – Y – Z

Where:

BXDB: Designates product family

4040: Designates die size (40 mil x 40 mil)

XXX: Designates dominant wavelength bin

Y: Designates radiometric power bin

Z: Designates forward voltage bin

Part Numbering and Bin Definitions

Bridgelux LED chips are sorted into the brightness and dominant wavelength bins shown below at I_f = 700 mA. Each blue tape contains die from only one brightness bin and one wavelength bin.

The forward voltage bins are 2.8-2.9 V (L1), 2.9-3.0 V (L2), 3.0-3.1 V (A1), 3.1-3.2 V (A2), 3.2-3.3 V (B1) and 3.3-3.4 V (B2). The maximum forward voltage (V_f max) = 3.4 V.

Dominant Wavelength	Power Bin M4 (900 – 950 mW)	Power Bin M5 (950 – 1000 mW)	Power Bin M6 (1000 – 1050 mW)
450 to 452.5nm	BXDB4040450-M4-z	BXDB4040450-M5-z	BXDB4040450-M6-z
452.5 to 455nm	BXDB4040452-M4-z	BXDB4040452-M5-z	BXDB4040452-M6-z
455 to 457.5nm	BXDB4040455-M4-z	BXDB4040455-M5-z	BXDB4040455-M6-z
457.5 to 460nm	BXDB4040457-M4-z	BXDB4040457-M5-z	BXDB4040457-M6-z

Note: z = “L1” for Vf bin of 2.8-2.9V; z = “L2” for Vf bin of 2.9-3.0V; z = “A1” for Vf bin of 3.0-3.1V; z = “A2” for Vf bin of 3.1-3.2V; 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	1016(±25) μm ×1016(±25) μm
Wafer thickness	150(±10) μm
Pad Gap	250(±10)μm
Anode Pad (AuSn)	826(±10)μm X 288(±10)μm
Cathode Pad (AuSn)	826(±10)μm X 288(±10)μm

Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating	Condition
DC Forward Current	I_f	1000 mA[1]	T_a=25°C
Forward Voltage	V_f	3.4 V	I_f = 700 mA
Reverse voltage	V_r	-5V	T_a=25°C
Reverse Current	I_r	1.0 μA	V_r = -5 V
Junction Temperature	T_j	150ºC	
Assembly Process Temp.		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 BXDB4040 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 silver plated single layer flip chip substrates 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.

Environmental Compliance

Bridgelux is committed to providing environmentally friendly products to the solid state lighting market. Bridgelux BXDB4040 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 BXDB4040 die products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Performance vs. Current

The following curves represent typical performance of the BXDB4040 blue power die. Actual performance will vary slightly for different power, dominant wavelength and Vf bins.

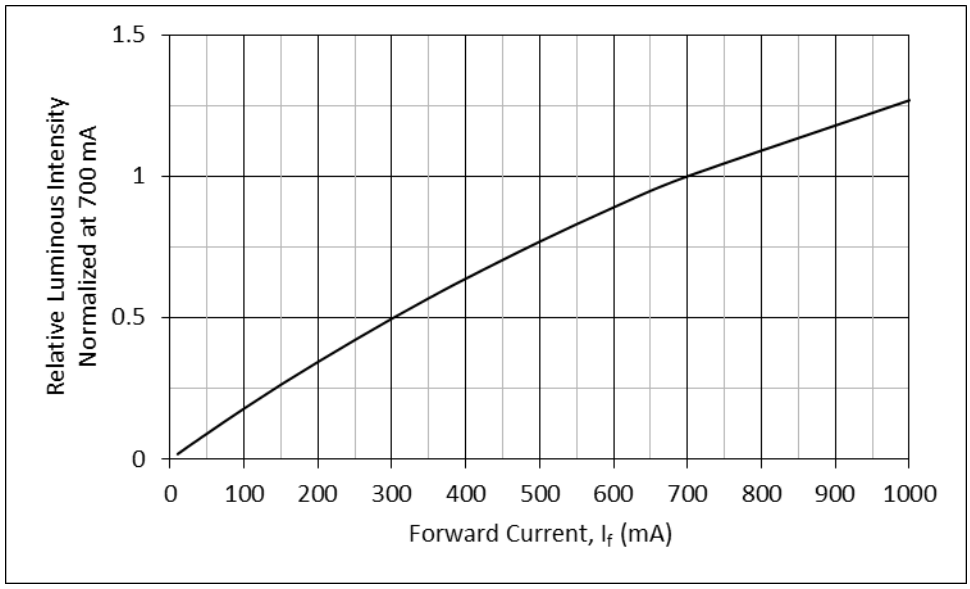

Figure 1: Relative Luminous Intensity vs. Forward Current (T_j = 25°C)

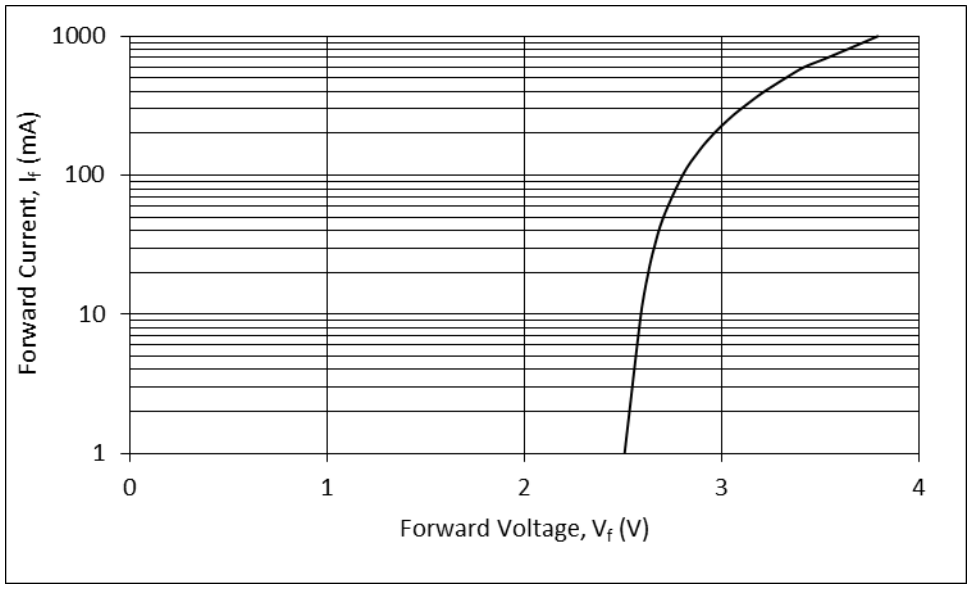

Figure 2: Forward Current vs. Forward Voltage (T_j = 25°C)

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Performance vs. Junction Temperature

The following curves represent typical performance of the BXDB4040 blue power die. Actual performance will vary slightly for different power, dominant wavelength and Vf bins.

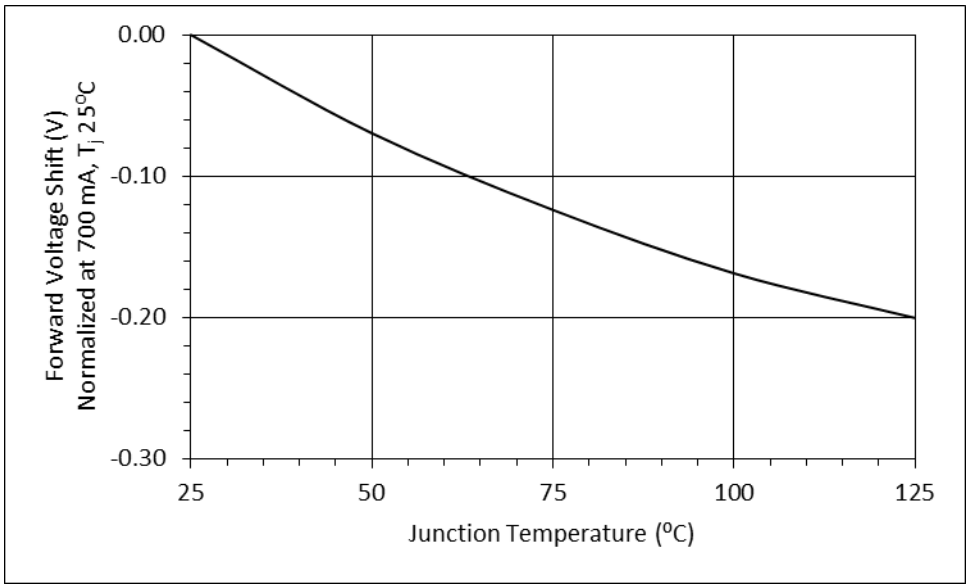

Figure 3: Forward Voltage Shift vs. Junction Temperature

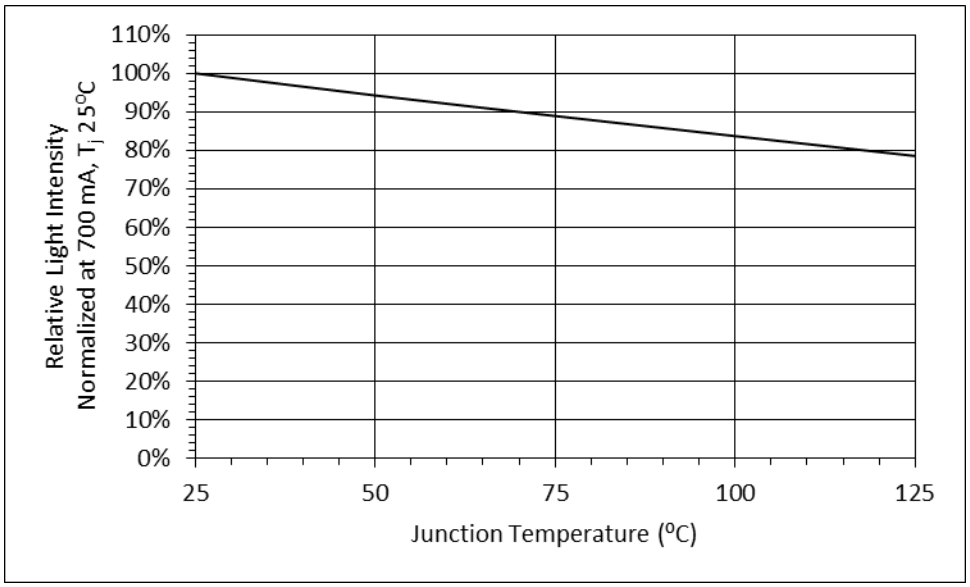

Figure 4: Relative Light Intensity vs. Junction Temperature

Wavelength Shift

The following curves represent typical performance of the BXDB4040 blue power die. Actual performance will vary slightly for different power, dominant wavelength and Vf bins.

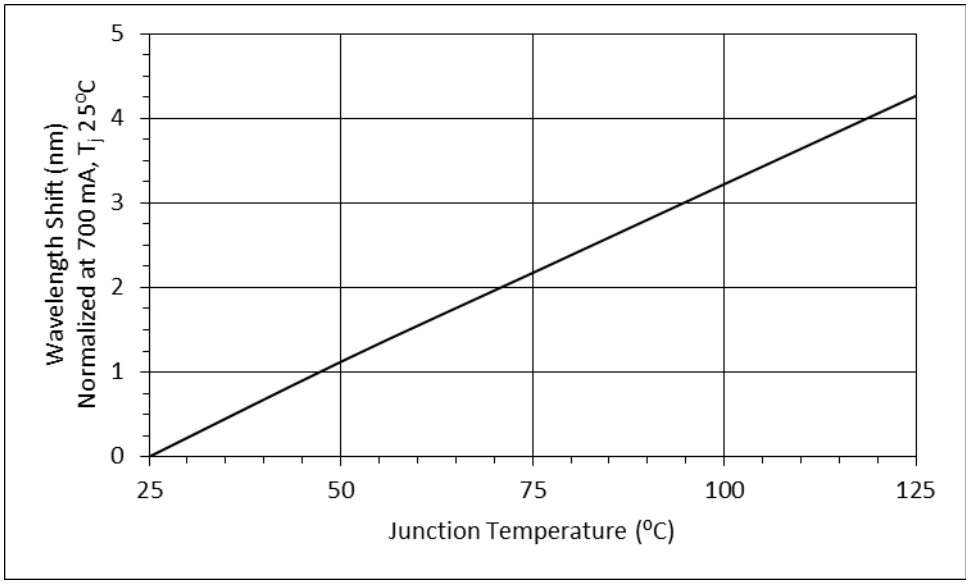

Figure 5: Wavelength Shift vs. Junction Temperature

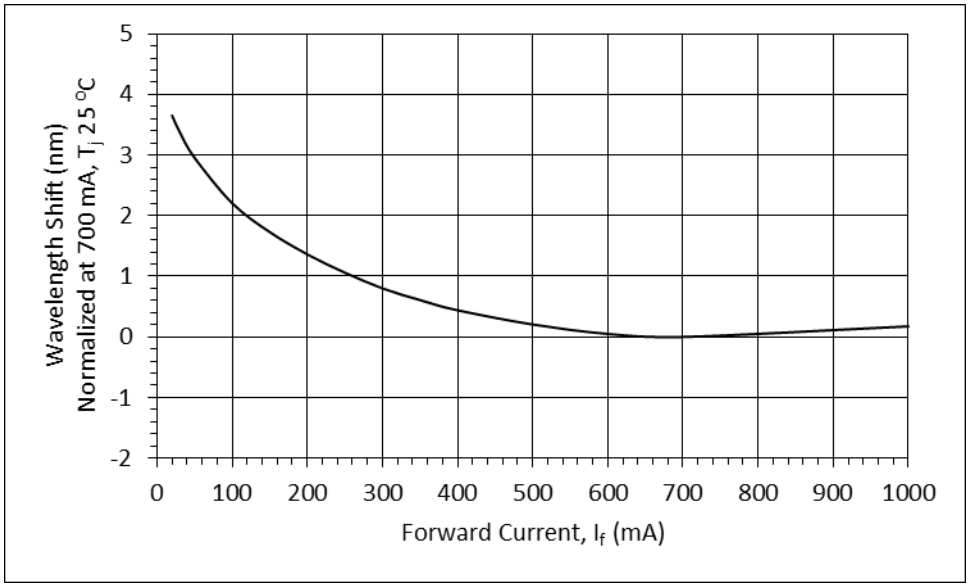

Figure 6: Wavelength Shift vs. Forward Current

Current De-rating Curves

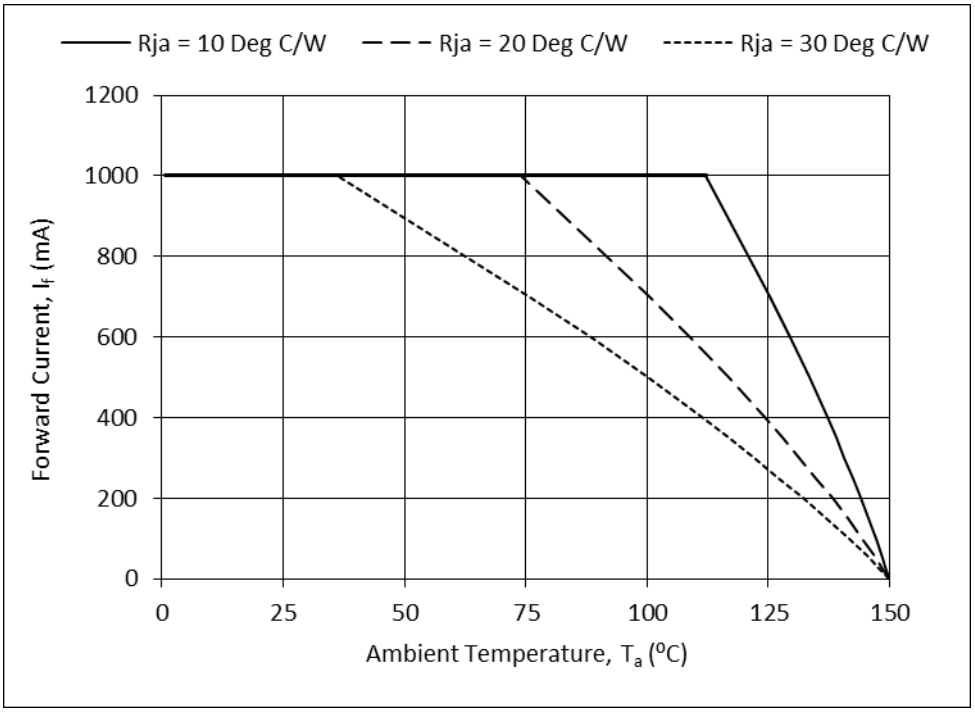

Figure 7: Current Derating Curve vs. Ambient Temperature (derating based on T_j max 150°C)

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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. 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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