



Bridgelux® EB Series™ Gen 2

Product Data Sheet DS131

Introduction

EB Series™



EB Series Gen 2 Linears are designed for use in premium indoor or industrial applications where a high level of efficacy is required. The new generation uses the high-efficacy SMDs to achieve up to 180lm/W, which enables designers and fixture manufacturers to meet DLC Premium requirements. They are designed for linear troffers, pendants and other luminaires in indoor commercial and industrial applications.

Available in 280 mm, 560 mm, and 1120 mm lengths, the modules can be connected end-to-end thereby providing flexibility in designing luminaires. The Zhaga compatible modules further simplify design by providing easy mounting options, reusable poke-in connectors and by being compatible with a variety of off-the-shelf optics. The modules have long lifetimes of greater than 50,000 hours.

Features

- Leading efficacy, up to 180 lm/W typical with 2x overdrive capability
- Ideal for DLC Premium Application
- Uniform, high quality illumination
- Available in a variety of color temperatures
- Designed following Zhaga Book 7 standards L28W2 and L56W2
- ENERGY STAR® / ANSI compliant 3 SDCM color binning structure
- Lumen output of up to 2386lm, 4772lm, and 9544lm for 280mm, 560mm and 1120mm modules

Benefits

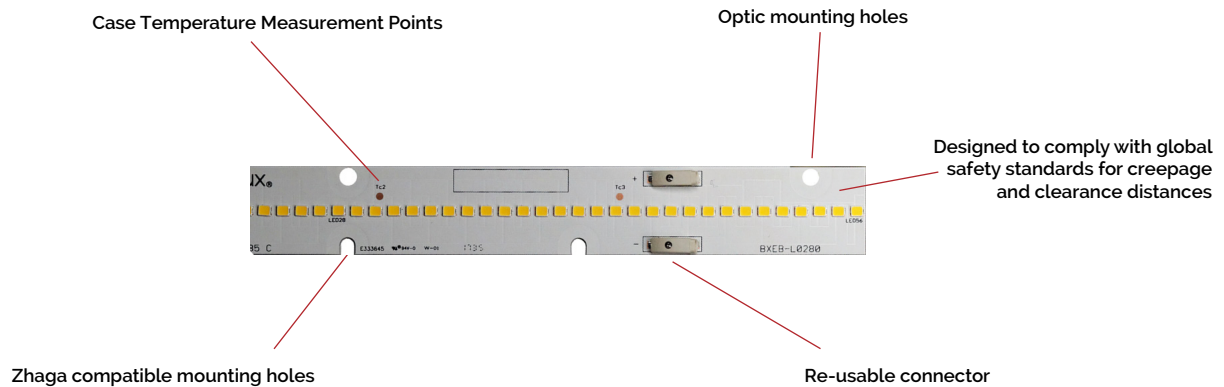
- Compact system design
- High quality, true color reproduction
- Enhanced optical control
- Uniform, consistent white light
- Reliable use at elevated currents enables greater design flexibility
- Easy installation using mounting cutout and connectors
- Long lifetime of > 50,000 hours
- Easy wiring enabled by poke-in connectors

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Product Feature Map

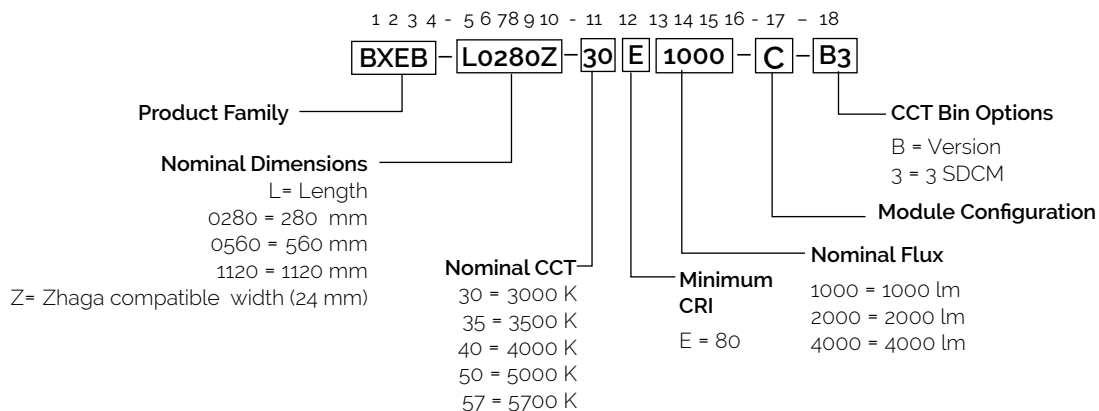
Bridgelux EB Series Gen 2 Linears are fully engineered devices that provide consistent thermal and optical performance on an engineered mechanical platform. The linear products incorporate several features to simplify design integration and assembly. Please visit www.bridgelux.com for more information on the EB Series family of products.



Note: Label containing part number and lot codes is attached on the front of the module.

Product Nomenclature

The part number designation for Bridgelux EB Series Gen 2 is explained as follows:



Product Selection Guide

The following product configurations are available:

Table 1: Selection Guide, Measurement Data ($T_c = 25^\circ \text{C}$)

Part Number	Nominal CCT ¹ (K)	CRI ²	Nominal Drive Current (mA)	Typical Flux ^{3,4} $T_{c2} = 25^\circ \text{C}$ (lm)	Minimum Flux ^{4,5} $T_{c2} = 25^\circ \text{C}$ (lm)	Typical V_f (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXEB-L0280Z-30E1000-C-B3	3000	80	350	1195	1076	19.5	6.8	175
BXEB-L0280Z-35E1000-C-B3	3500			1195	1076	19.5	6.8	175
BXEB-L0280Z-40E1000-C-B3	4000			1230	1107	19.5	6.8	180
BXEB-L0280Z-50E1000-C-B3	5000			1230	1107	19.5	6.8	180
BXEB-L0280Z-57E1000-C-B3	5700			1230	1107	19.5	6.8	180
BXEB-L0560Z-30E2000-C-B3	3000	80	700	2390	2151	19.5	13.6	175
BXEB-L0560Z-35E2000-C-B3	3500			2390	2151	19.5	13.6	175
BXEB-L0560Z-40E2000-C-B3	4000			2460	2214	19.5	13.6	180
BXEB-L0560Z-50E2000-C-B3	5000			2460	2214	19.5	13.6	180
BXEB-L0560Z-57E2000-C-B3	5700			2460	2214	19.5	13.6	180
BXEB-L1120Z-30E4000-C-B3	3000	80	700	4780	4302	39.0	27.3	175
BXEB-L1120Z-35E4000-C-B3	3500			4780	4302	39.0	27.3	175
BXEB-L1120Z-40E4000-C-B3	4000			4920	4428	39.0	27.3	180
BXEB-L1120Z-50E4000-C-B3	5000			4920	4428	39.0	27.3	180
BXEB-L1120Z-57E4000-C-B3	5700			4920	4428	39.0	27.3	180

Notes for Table 1:

1. Nominal CCT as defined by ANSI C78.377-2011.
2. CRI Values are minimums.
3. Products tested at nominal test current where temperature of center case temperature point $T_c = 25^\circ \text{C}$. Values may vary depending on the thermal design of the luminaire and/or the exposed environment to which the product is subjected.
4. Bridgelux maintains a $\pm 7\%$ tolerance on flux measurements.
5. Minimum performance values are provided as reference only and are not a guarantee of performance.

Electrical Characteristics

Table 2: Electrical Characteristics

Part Number	Drive Current (mA)	Forward Voltage $T_{c2} = 25^{\circ}\text{C}$ (V) ^{1, 2, 3}			Typical Coefficient of Forward Voltage ⁴ $\Delta V_f / \Delta T$ (mV/°C)	Driver Selection Voltages ⁵ (V)	
		Minimum	Typical	Maximum		V_f Min, Hot $T_{c2} = 85^{\circ}\text{C}$ (V)	V_f Max, Cold $T_{c2} = -40^{\circ}\text{C}$ (V)
BXEB-L0280Z-xxx1000-C-B3	350	18.5	19.5	20.6	-7.0	18.1	21.1
	700	19.4	20.5	21.6	-7.0	19.0	22.1
BXEB-L0560Z-xxx2000-C-B3	700	18.5	19.5	20.6	-7.0	18.1	21.1
	1400	19.4	20.5	21.6	-7.0	19.0	22.1
BXEB-L1120Z-xxx4000-C-B3	700	37.0	39.0	41.2	-14.0	36.2	42.1
	1400	38.8	41.0	43.2	-14.0	38.0	44.1

Notes for Table 2:

1. Voltage minimum and maximum are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a tolerance of ± 0.10 V on forward voltage measurements.
3. This product has been designed and manufactured per IEC 62031:2014. The working voltage designated for the insulation is 60 V d.c. The maximum allowable voltage across the module must be determined in the end product application.
4. Typical coefficient of forward voltage tolerance is ± 0.1 mV for nominal current.
5. V_f min hot and max cold values are provided as reference only and are not guaranteed. These values are provided to aid in driver design and selection over the operating range of the product.

Absolute Maximum Ratings

Table 3: Maximum Ratings

Parameter	Maximum Rating		
Storage Temperature	-40°C to +85°C		
Operating Case Temperature ¹ (T _c)	85°C		
Soldering Temperature ²	350°C or lower for a maximum of 5 seconds		
Maximum Reverse Voltage	Linears are not designed to be driven in reverse bias		
	BXEB-L0280Z-xxx1000-C-B3	BXEB-L0560Z-xxx2000-C-B3	BXEB-L1120Z-xxx4000-C-B3
Maximum Drive Current ³	700mA	1400mA	1400mA

Notes for Table 3:

1. For IEC 62717 requirement, please consult your Bridgelux sales representative.
2. Lumen maintenance (L70) and lifetime predictions are valid for drive current and case temperature conditions used for LM-80 testing as included in the applicable LM-80 test report for the SMDs used in the modules. Contact your Bridgelux sales representatives for LM-80 report.

Performance Curves

Figure 1: 280mm Current vs. Forward Voltage, $T_c=25^\circ\text{C}$

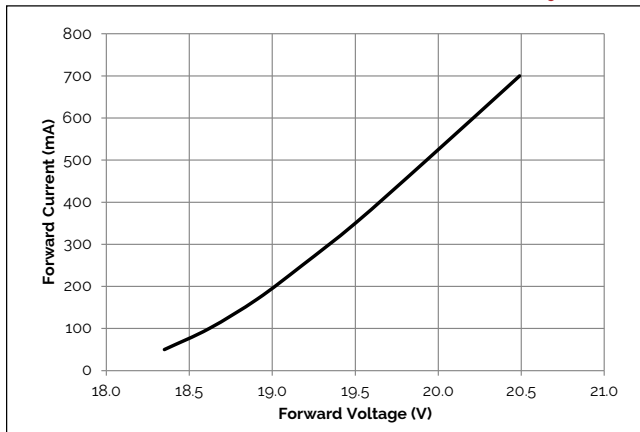


Figure 2: 280mm Relative Flux vs. Current, $T_c=25^\circ\text{C}$

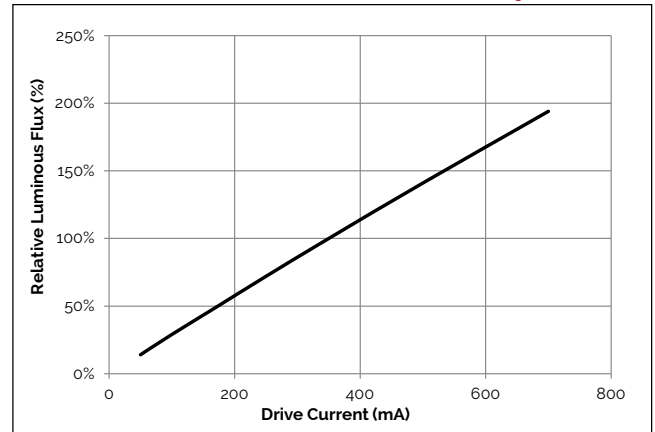


Figure 3: 560mm Current vs. Forward Voltage, $T_c=25^\circ\text{C}$

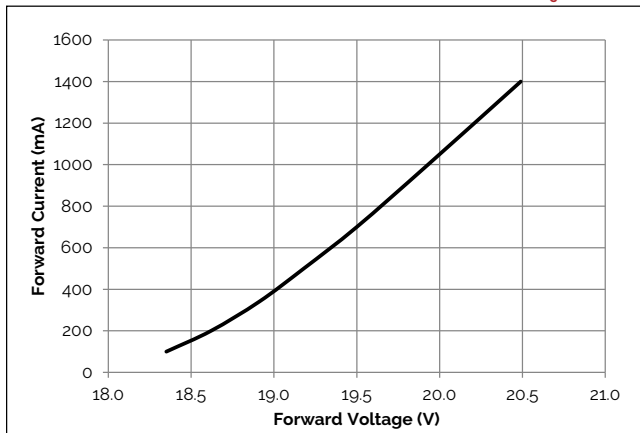


Figure 4: 560mm Relative Flux vs. Current, $T_c=25^\circ\text{C}$

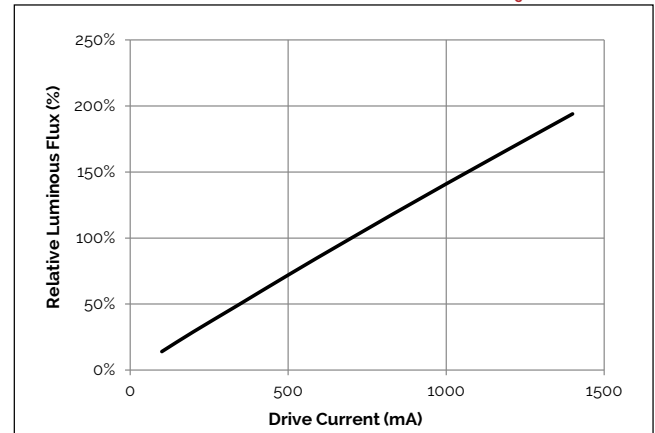


Figure 5: 1120mm Current vs. Forward Voltage, $T_c=25^\circ\text{C}$

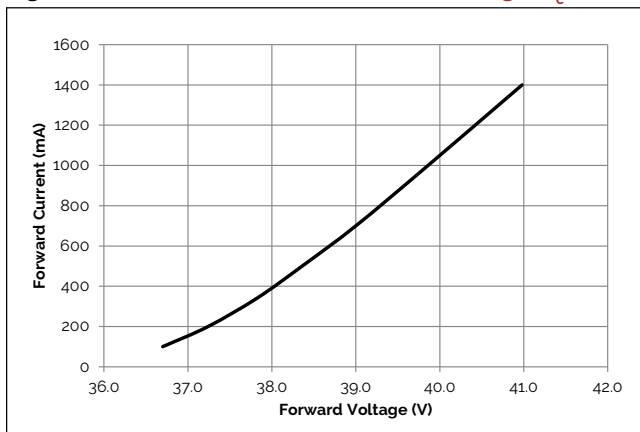
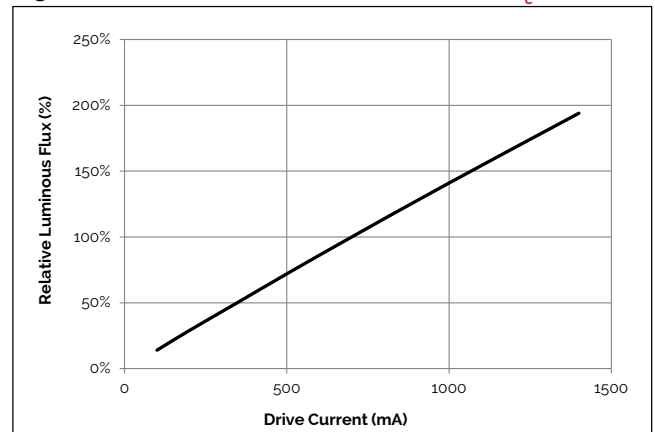


Figure 6: 1120mm Relative Flux vs. Current, $T_c=25^\circ\text{C}$



Performance Curves

Figure 7: Relative Flux vs. Case Temperature

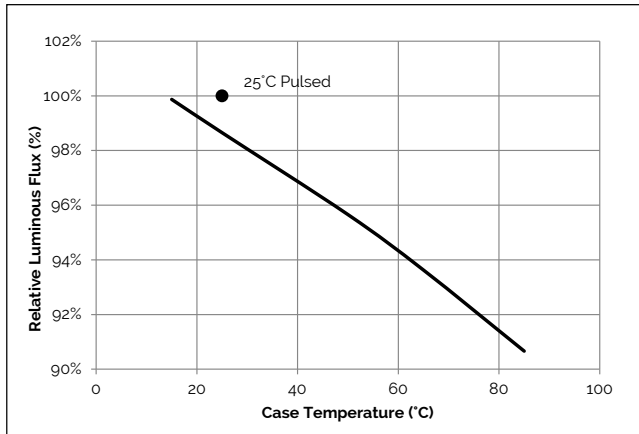
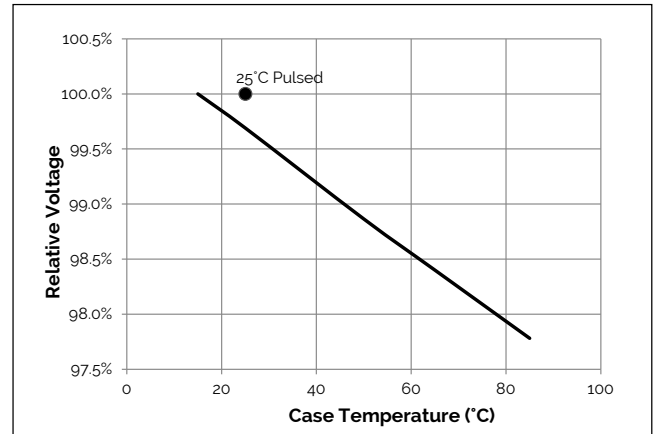
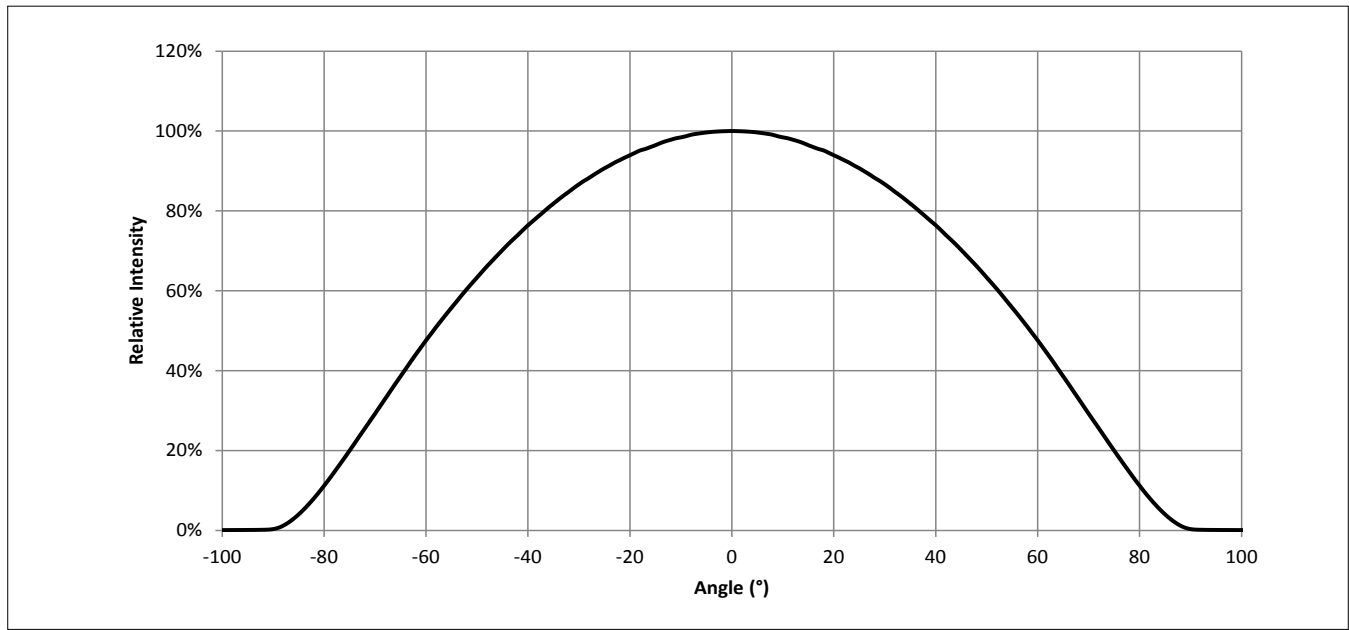


Figure 8: Relative Voltage vs. Case Temperature



Typical Radiation Pattern

Figure 9: Typical Spatial Radiation Pattern

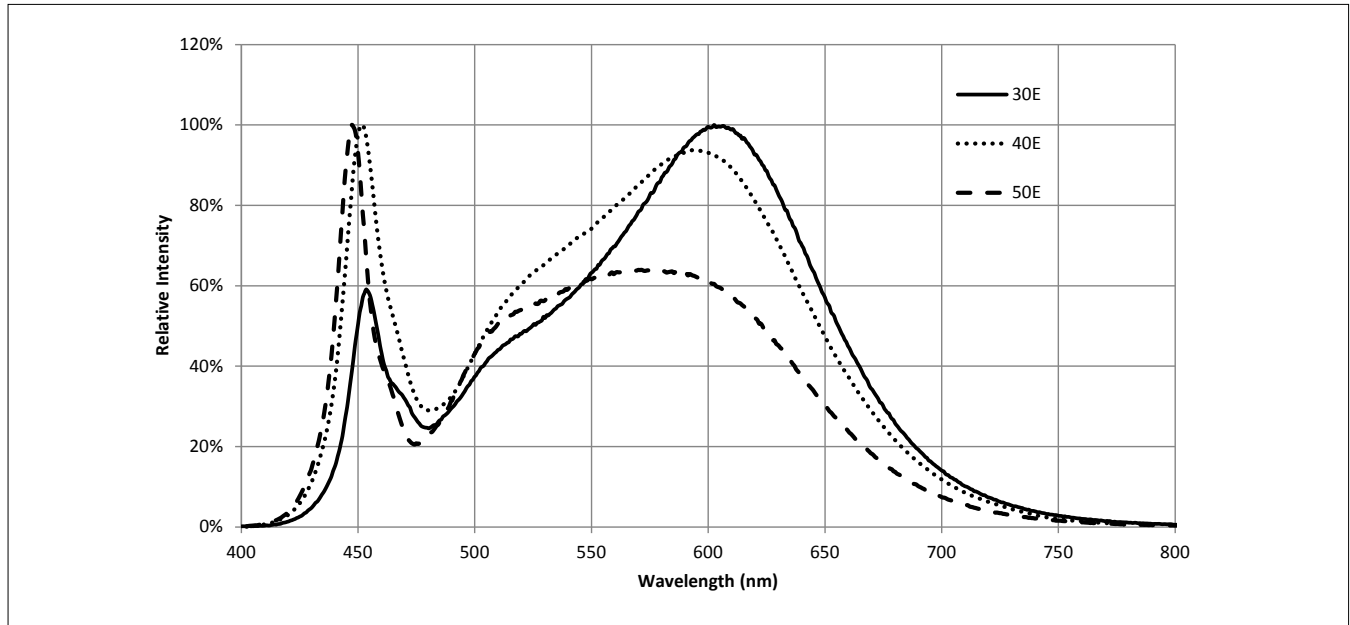


Notes for Figure 9:

1. Typical viewing angle is 120°.
2. The viewing angle is defined as the off axis angle from the centerline where I_v is $\frac{1}{2}$ of the peak value.

Typical Color Spectrum

Figure 10: Typical Color Spectrum



Note for Figure 10:

1. Color spectra measured at nominal current for $T_{c2} = 50^{\circ}\text{C}$.
2. Color spectra shown for 30E is 3000K and 80 CRI.
3. Color spectra shown for 40E is 4000K and 80 CRI.
4. Color spectra shown for 57E is 5700K and 80 CRI.

Mechanical Dimensions

Figure 11: Drawing for EB Series Gen2 280mm

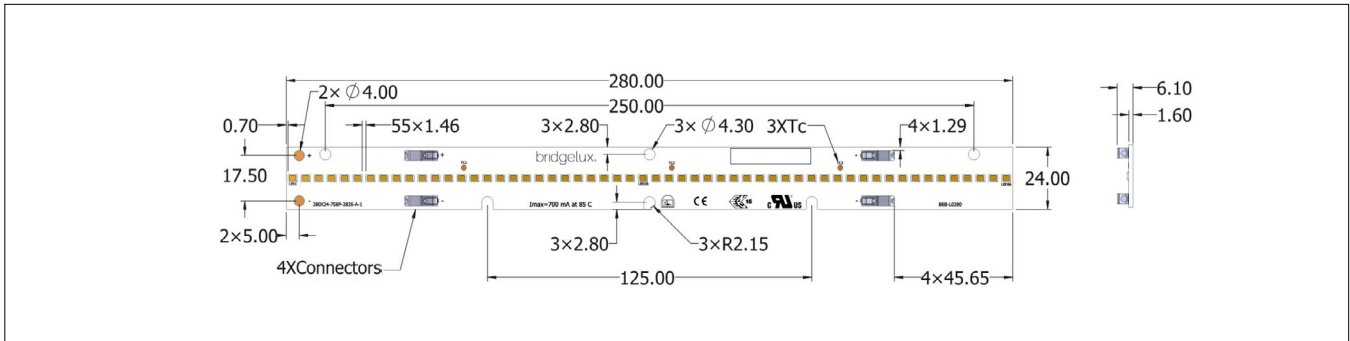


Table 4: Dimensions for 280mm

Parameter	Specification	Unit
Linear length	280	mm
Linear width	24	mm
Linear thickness	6.1	mm
PCB thickness	1.6	mm

Figure 12: Drawing for EB Series Gen2 560mm

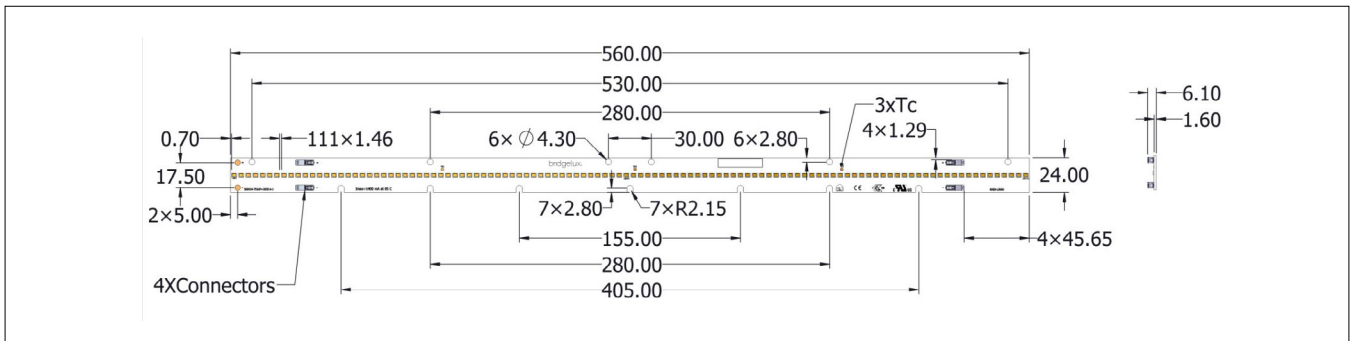


Table 5: Dimensions for 560mm

Parameter	Specification	Unit
Linear length	560	mm
Linear width	24	mm
Linear thickness	6.1	mm
PCB thickness	1.6	mm

Mechanical Dimensions

Figure 13: Drawing for EB Series Gen2 1120mm

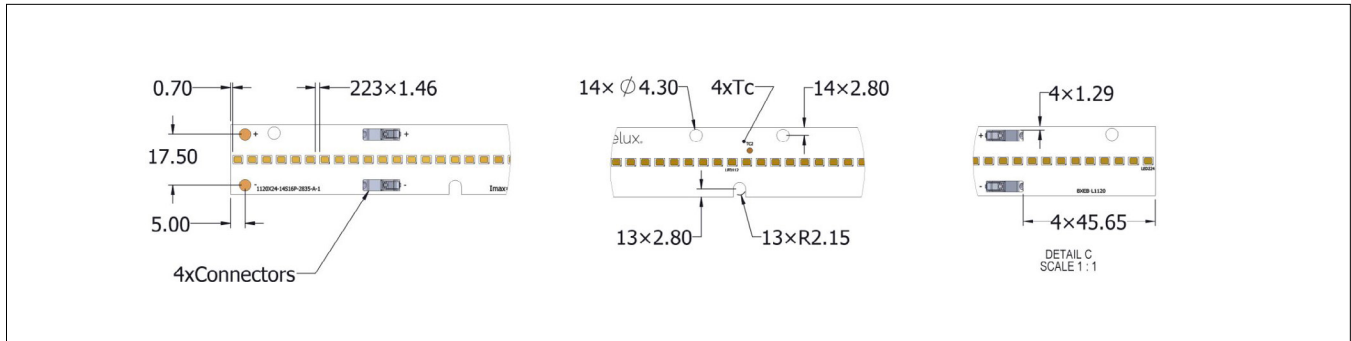


Table 6: Dimensions for 1120mm

Parameter	Specification	Unit
Linear length	1120	mm
Linear width	24	mm
Linear thickness	6.1	mm
PCB thickness	1.6	mm

Notes for Figures 11, 12 & 13:

1. Solder pads are labeled "+" to denote positive polarity, and "-" to denote negative polarity.
2. Drawings are not to scale.
3. Drawing dimensions are in millimeters.
4. Unless otherwise specified, the tolerances are $\pm 0.10\text{mm}$.

Table 7: Connector and wiring

Parameter	Specification
Input wire cross-section	18-24 AWG
Terminal strip length	7-9 mm

Color Binning Information

Figure 14: Graph of Warm and Neutral White Test Bins in xy Color Space

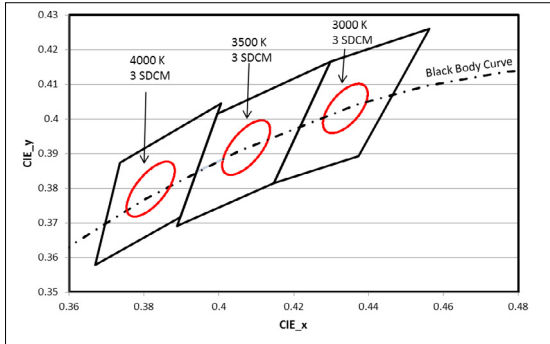


Table 8: Warm and Neutral White xy Bin Coordinates and Associated Typical CCT

Bin Code	3000K	3500 K	4000K
ANSI Bin (for reference only)	(2870K - 3220K)	(3220K - 3710K)	(3710K - 4260K)
B3 (3SDCM)	(2968K - 3136K)	(3369K - 3586K)	(3851K - 4130K)
Center Point (x,y)	(0.4338, 0.403)	(0.4073, 0.3917)	(0.3818, 0.3797)

Figure 15: Graph of Cool White Test Bins in xy Color Space

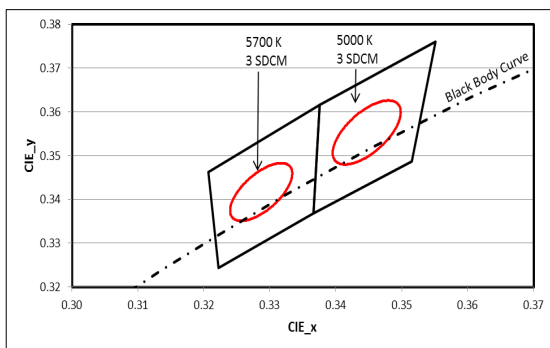


Table 9: Cool White xy Bin Coordinates and Associated Typical CCT

Bin Code	5000K	5700K
ANSI Bin (for reference only)	(4745K - 5311K)	(5312K - 6022K)
B3 (3SDCM)	(4835K - 5155K)	(5445K - 5850K)
Center Point (x,y)	(0.3447, 0.3553)	(0.3287, 0.3417)

Notes for Tables 8 and 9

1. Color binning at solder point temperature T_{sp} of SMDs at 85°C.
2. Bridgelux maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

Packaging and Labeling

Figure 16: EB Series Packaging and Labeling

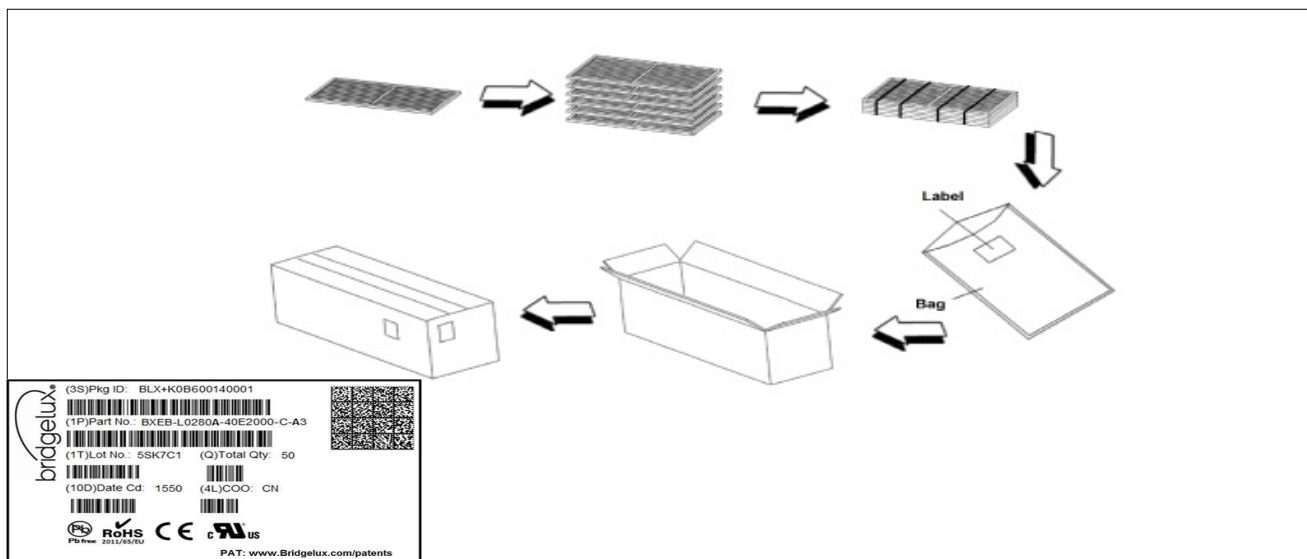


Table 10: Packaging Structure

L0280 modules	Tray	Box	Shipping Box
Quantity	40	200	400
Dimension	63 cm x 39 cm x 2.4 cm	63.5 cm x 41.5 cm x 13.5 cm	134 cm x 43.5 cm x 18 cm
L0560 modules	Tray	Box	Shipping Box
Quantity	20	100	200
Dimension	63 cm x 39 cm x 2.4 cm	63.5 cm x 41.5 cm x 13.5 cm	134 cm x 43.5 cm x 18 cm
L1120 modules	Tray	Box	Shipping Box
Quantity	20	n/a	100
Dimension	119 cm x 39 cm x 2.4 cm	n/a	134 cm x 43.5 cm x 18 cm

Figure 17: Product Labeling

Bridgelux EB Series modules contain a label on the front to help with product identification. In addition to the product identification markings, Bridgelux EB Series modules also contain markings for internal Bridgelux manufacturing use only. The image below shows which markings are for customer use and which ones are for Bridgelux internal use only. The Bridgelux internal manufacturing markings are subject to change without notice, however these will not impact the form, function or performance of the module.



EB Series Gen2
1ft 1000lm 350mA

Customer Use- 2D Barcode
Scannable barcode provides
product part number and other
Bridgelux internal production
information.

Design Resources

Application Notes

Bridgelux has developed a comprehensive set of application notes and design resources to assist customers in successfully designing with the EB Series product family. For a list of resources under development, visit www.bridgelux.com.

Optical Source Models

Optical source models and ray set files are available for all Bridgelux products. For a list of available formats, visit www.bridgelux.com.

3D CAD Models

Three dimensional CAD models depicting the product outline of all Bridgelux EB Series LED linears are available in both IGES and STEP formats. Please contact your Bridgelux sales representative for assistance.

Precautions

CAUTION: CHEMICAL EXPOSURE HAZARD

Exposure to some chemicals commonly used in luminaire manufacturing and assembly can cause damage to the LED linear. Please consult Bridgelux Application Note for additional information.

CAUTION: EYE SAFETY

Eye safety classification for the use of Bridgelux EB Series is in accordance with IEC/TR62778: Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires. EB Series linears are classified as Risk Group 1 (TBD) when operated at or below the maximum drive current. Please use appropriate precautions. It is important that employees working with LEDs are trained to use them safely.

CAUTION: RISK OF BURN

Do not touch the EB Series linears during operation. Allow the linear to cool for a sufficient period of time before handling. The EB Series linears may reach elevated temperatures such that could burn skin when touched.

CAUTION

CONTACT WITH LIGHT EMITTING SURFACE (LES)

Avoid any contact with the LES. Do not touch the LES of the linear or apply stress to the LES (yellow phosphor resin area). Contact may cause damage to the linear.

Optics and reflectors must not be mounted in contact with the LES (yellow phosphor resin area). Optical devices may be mounted on the top surface of the EB Series linear. Use the mechanical features of the linear housing, edges and/or mounting holes to locate and secure optical devices as needed.

Disclaimers

STANDARD TEST CONDITIONS

Unless otherwise stated, linear testing is performed at the nominal drive current.

MINOR PRODUCT CHANGE POLICY

The rigorous qualification testing on products offered by Bridgelux provides performance assurance. Slight cosmetic changes that do not affect form, fit, or function may occur as Bridgelux continues product optimization.

About Bridgelux: We Build Light That Transforms

At Bridgelux, we help companies, industries and people experience the power and possibility of light. Since 2002, we've designed LED solutions that are high performing, energy efficient, cost effective and easy to integrate. Our focus is on light's impact on human behavior, delivering products that create better environments, experiences and returns—both experiential and financial. And our patented technology drives new platforms for commercial and industrial luminaires.

For more information about the company, please visit

bridgelux.com

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Bridgelux EB Series Gen2 Data Sheet DS131 Rev. A (10/2017)

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