

# Bridgelux® Vero13 F90 BBBL Array

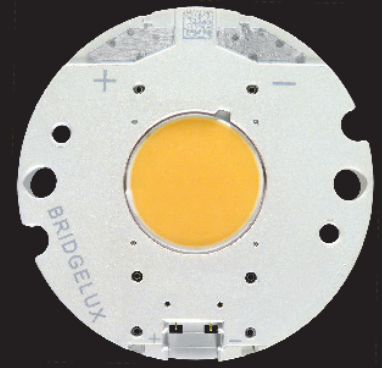
Product Data Sheet DS436-2



BXRC-27G | 30G | 35G | 40G

# Introduction

Vero® F90



The Vero® Series is a revolutionary advancement in chip on board (COB) light source technology and innovation, simplifying the luminaire design and manufacturing processes. Vero Chip on Board (COB) LED arrays are available in four LES configurations, engineered to enable new degrees of flexibility and reliability over a broad range of electrical currents. Vero arrays deliver increased lumen density to enable improved beam control and precision lighting with 2 and 3 SDCM color control standard for clean and consistent uniform lighting.

Vero products include an onboard connector port that enables a solder-free electrical interconnect, and simple mounting features for plug-and-play installation.

The F90 Vero Series COB is a high efficacy product that uses narrow band red phosphor to significantly improve the spectrum efficacy. The improved spectrum efficacy results in the 90 CRI product of the F90 Series delivering better or equivalent efficacy as that of our traditional 80 CRI Vero Series product.

## Features

- Efficacy of 179 lm/W typical, 3000K 90 CRI
- Wide selection of CCT options (2700K-4000K) with minimum 90 CRI options
- Uniform high-quality illumination
- 2 and 3 SDCM binning options (2700K – 4000K)
- Forward voltage bin codes and backside marking
- Instant light with unlimited dimming
- Thermally isolated solder pads
- 10-Year warranty

## Benefits

- Solder free installation and field upgradability
- Improved inventory management and quality control
- Enables high efficiency lighting systems and lower operating costs
- Supports the trend toward luminaire miniaturization and delivers enhanced optical control
- Design flexibility for a broad range of lighting applications
- Clean white light without pixelation
- Uniform consistent white light
- Design flexibility for multi-source applications
- Enhanced ease of use and installation



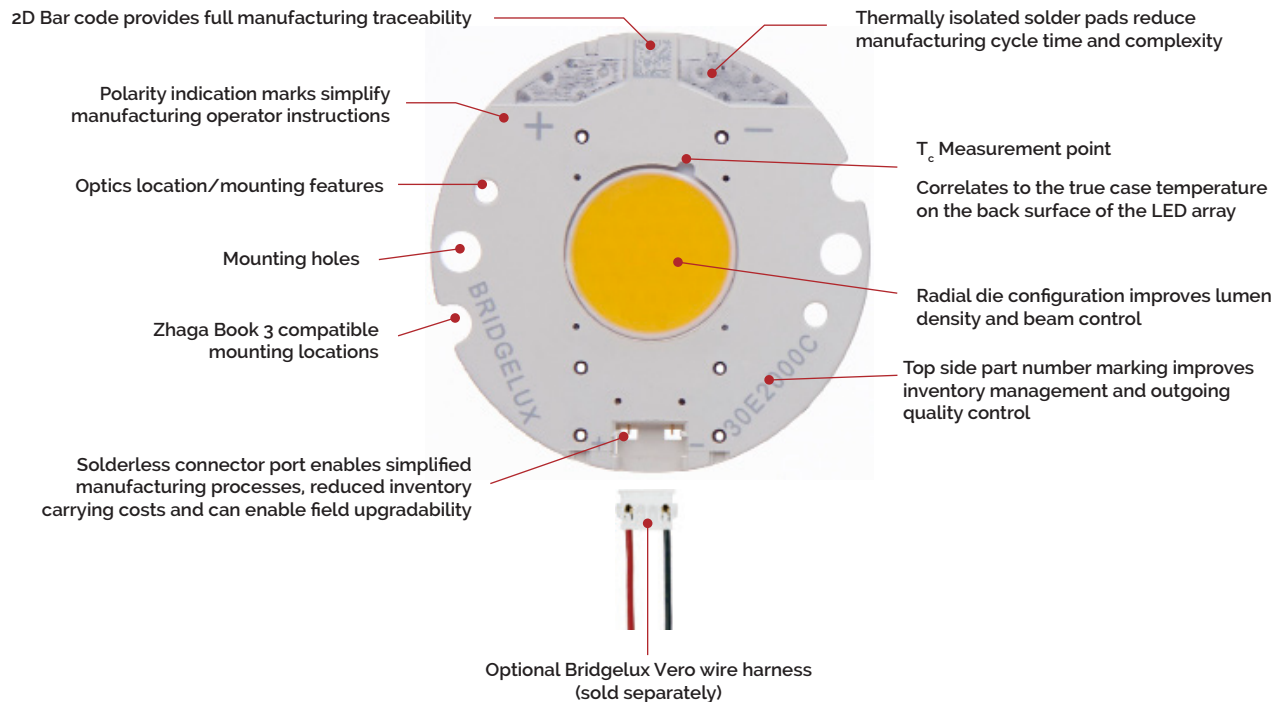
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# Product Feature Map

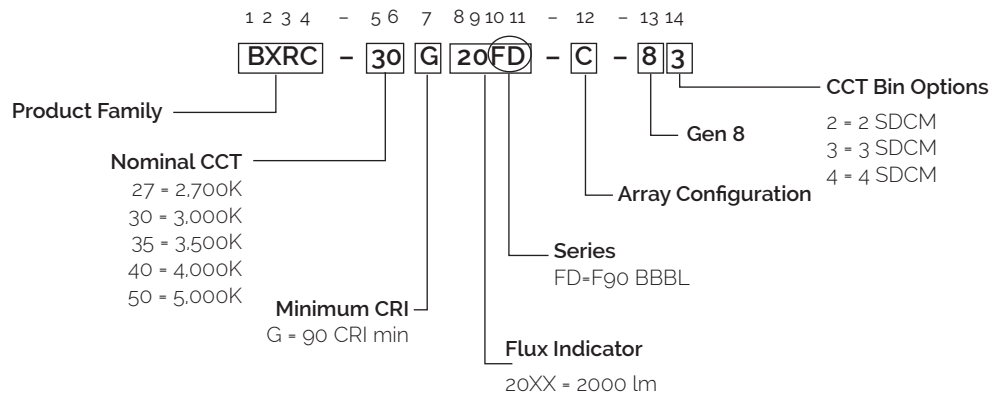
Vero 13 is the second smallest form factor in the Vero family of the next generation solid state light sources. In addition to delivering the performance and light quality required for many lighting applications, Vero incorporates

several features to simplify the design integration and manufacturing process, accelerate time to market and reduce system costs. Please visit [www.bridgelux.com](http://www.bridgelux.com) for more information on the Vero Series family of products.



## Product Nomenclature

The part number designation for Bridgelux COB arrays is explained as follows:



# Product Selection Guide

The following product configurations are available:

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

Part Number	Nominal CCT <sup>1</sup> (K)	CRI <sup>2</sup>	Nominal Drive Current <sup>3</sup> (mA)	Typical Pulsed Flux <sup>4,5,6</sup> $T_c = 25^\circ\text{C}$ (lm)	Minimum Pulsed Flux <sup>6,7</sup> $T_c = 25^\circ\text{C}$ (lm)	Typical $V_f$ (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXRC-27G20FD-B-8x	2700	90	350	2112	1900	34.3	12.0	176
BXRC-27G20FD-C-8x	2700	90	500	3006	2705	34.3	17.2	175
BXRC-30G20FD-B-8x	3000	90	350	2155	1939	34.3	12.0	179
BXRC-30G20FD-C-8x	3000	90	500	3077	2769	34.3	17.2	179
BXRC-35G20FD-B-8x	3500	90	350	2141	1927	34.3	12.0	178
BXRC-35G20FD-C-8x	3500	90	500	3056	2751	34.3	17.2	178
BXRC-40G20FD-B-8x	4000	90	350	2165	1948	34.3	12.0	180
BXRC-40G20FD-C-8x	4000	90	500	3081	2773	34.3	17.2	180

**Table 2:** Selection Guide, Stabilized DC Test Performance ( $T_c = 65^\circ\text{C}$ )<sup>4,5,6</sup>

Part Number	Nominal CCT <sup>1</sup> (K)	CRI <sup>2</sup>	Nominal Drive Current <sup>3</sup> (mA)	Typical DC Flux <sup>4,5</sup> $T_c = 65^\circ\text{C}$ (lm)	Minimum DC Flux <sup>6</sup> $T_c = 65^\circ\text{C}$ (lm)	Typical $V_f$ (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXRC-27G20FD-B-8x	2700	90	350	1974	1777	33.9	11.8	167
BXRC-27G20FD-C-8x	2700	90	500	2811	2530	33.9	16.9	166
BXRC-30G20FD-B-8x	3000	90	350	2014	1813	33.9	11.8	170
BXRC-30G20FD-C-8x	3000	90	500	2877	2589	33.9	16.9	170
BXRC-35G20FD-B-8x	3500	90	350	2002	1802	33.9	11.8	169
BXRC-35G20FD-C-8x	3500	90	500	2858	2572	33.9	16.9	169
BXRC-40G20FD-B-8x	4000	90	350	2024	1822	33.9	11.8	171
BXRC-40G20FD-C-8x	4000	90	500	2881	2593	33.9	16.9	170

Notes for Table 1 & 2:

1. Nominal CCT as defined by ANSI C78.377-2011.
2. CRI values are minimums and tested at  $T_j = T_c = 65^\circ\text{C}$ . Minimum R<sub>g</sub> value for 90 CRI products is 50. Bridgelux maintains a  $\pm 3$  tolerance on CRI and R<sub>g</sub> values.
3. Drive current is referred to as nominal drive current.
4. Products tested under pulsed condition (10ms pulse width) at nominal drive current where  $T_j$  (junction temperature) =  $T_c$  (case temperature) =  $25^\circ\text{C}$ .
5. Typical performance values are provided as a reference only and are not a guarantee of performance.
6. Bridgelux maintains a  $\pm 7\%$  tolerance on flux measurements.
7. Minimum flux values at the nominal drive current are guaranteed by 100% test.


# European Product Registry for Energy Labeling

The European Product Registry for Energy Labeling (EPREL) is defined in the EU Regulation 2017/1369 to provide important energy efficiency information to consumers. Together with Energy Labeling Regulation ELR (EU) 2019/2015 which was amended by regulation (EU) 2021/340 for energy labelling of light sources, manufacturers are required to declare an energy class based on key technical specifications from each of their product and register it in an open data base managed by EPREL. It is now a legal requirement for a vendor of light sources to upload information about their products into the EPREL database before placing these products on the market in the EU.

Table 3 below provides a list of part numbers that are in compliance with ELR and are currently listed in the EPREL database.

At Bridgelux, we are fully committed to supplying products that are compliant with pertinent laws, rules, and obligation imposed by relevant government bodies including the European Energy Labeling regulation. Customers can use these products with full confidence for any projects that fall under the ELR.

**Table 3:** Part numbers registered in European Product Registry for Energy Labeling

PART NUMBER <sup>1</sup>	CCT (K)	CRI	Current <sup>2</sup> (mA)	Vf (V)	Useful flux <sup>3</sup> ( $\Phi_{use}$ ) at 85°C (lm)	Power (W)	Efficacy (lm/W)	Energy efficiency class <sup>4</sup> 	Registration No	URL to Product Information Sheet in EPREL Database
BXRC-27G20FD-B-83	2700	90	900	38.6	4597	35	132	E	1531507	<a href="https://epreLec.europa.eu/qr/1531507">https://epreLec.europa.eu/qr/1531507</a>
BXRC-27G20FD-C-83	2700	90	1260	38.0	6422	48	134	E	1531508	<a href="https://epreLec.europa.eu/qr/1531508">https://epreLec.europa.eu/qr/1531508</a>
BXRC-30G20FD-B-83	3000	90	900	38.6	4691	35	135	E	1531525	<a href="https://epreLec.europa.eu/qr/1531525">https://epreLec.europa.eu/qr/1531525</a>
BXRC-30G20FD-C-83	3000	90	1260	38.0	6553	48	137	E	1531526	<a href="https://epreLec.europa.eu/qr/1531526">https://epreLec.europa.eu/qr/1531526</a>
BXRC-35G20FD-B-83	3500	90	900	38.6	4738	35	136	E	1531543	<a href="https://epreLec.europa.eu/qr/1531543">https://epreLec.europa.eu/qr/1531543</a>
BXRC-35G20FD-C-83	3500	90	1260	38.0	6619	48	138	E	1531544	<a href="https://epreLec.europa.eu/qr/1531544">https://epreLec.europa.eu/qr/1531544</a>
BXRC-40G20FD-B-83	4000	90	900	38.6	4785	35	138	E	1531561	<a href="https://epreLec.europa.eu/qr/1531561">https://epreLec.europa.eu/qr/1531561</a>
BXRC-40G20FD-C-83	4000	90	1260	38.0	6684	48	140	E	1531562	<a href="https://epreLec.europa.eu/qr/1531562">https://epreLec.europa.eu/qr/1531562</a>

Notes for Table 3:

1. All device listed here must be disposed as e-waste upon its end of life according to local country guideline in each country.
2. For information on performance values at alternative drive conditions, please refer to the Product Selection Guide, Absolute Maximum Rating Table and Performance Curves in this data sheet.
3. For a definition of useful luminous flux ( $\Phi_{use}$ ), please see the ELR regulations at <https://tinyurl.com/4b6zvt4m>.
4. EPREL requires an arrow symbol containing the letter of the energy efficiency class to be displayed, on technical promotional material. Refer to this energy efficiency class column for specific energy efficiency class on each part number.

# Performance at Commonly Used Drive Currents

Vero LED arrays are tested to the specifications shown using the nominal drive currents in Table 1. Vero may also be driven at other drive currents dependent on specific application design requirements. The performance at any drive current can be derived from the current vs. voltage characteristics shown in Figures 1 & 2 and the flux vs. current characteristics shown in Figures 3 & 4. The performance at commonly used drive currents is summarized in Table 4.

**Table 4:** Product Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current <sup>1</sup> (mA)	Typical $V_f$ $T_c = 25^\circ\text{C}$ (V)	Typical Power $T_c = 25^\circ\text{C}$ (W)	Typical Flux <sup>2</sup> $T_c = 25^\circ\text{C}$ (lm)	Typical DC Flux <sup>3</sup> $T_c = 65^\circ\text{C}$ (lm)	Typical Efficacy $T_c = 25^\circ\text{C}$ (lm/W)
BXRC-27G20FD-B-8x	90	175	33.0	5.8	1062	1025	184
		260	33.6	8.7	1578	1496	180
		<b>350</b>	<b>34.3</b>	<b>12.0</b>	<b>2112</b>	<b>1974</b>	<b>176</b>
		450	35.0	15.7	2687	2484	171
		700	36.6	25.6	4045	3661	158
		900	37.7	34.0	5048	4518	149
BXRC-27G20FD-C-8x	90	250	33.0	8.2	1529	1460	185
		375	33.6	12.6	2294	2150	182
		<b>500</b>	<b>34.3</b>	<b>17.1</b>	<b>3006</b>	<b>2811</b>	<b>175</b>
		630	34.9	22.0	3791	3472	172
		1000	36.6	36.6	5810	5206	159
		1260	37.7	47.5	7122	6299	150
BXRC-30G20FD-B-8x	90	175	33.0	5.8	1084	1046	188
		260	33.6	8.7	1611	1527	184
		<b>350</b>	<b>34.3</b>	<b>12.0</b>	<b>2155</b>	<b>2014</b>	<b>179</b>
		450	35.0	15.7	2742	2535	174
		700	36.6	25.6	4128	3736	161
		900	37.7	34.0	5151	4610	152
BXRC-30G20FD-C-8x	90	250	33.0	8.2	1565	1495	190
		375	33.6	12.6	2348	2201	186
		<b>500</b>	<b>34.3</b>	<b>17.1</b>	<b>3077</b>	<b>2877</b>	<b>179</b>
		630	34.9	22.0	3881	3554	176
		1000	36.6	36.6	5948	5329	162
		1260	37.7	47.5	7290	6447	154
BXRC-35G20FD-B-8x	90	175	33.0	5.8	1076	1039	186
		260	33.6	8.7	1601	1517	183
		<b>350</b>	<b>34.3</b>	<b>12.0</b>	<b>2141</b>	<b>2002</b>	<b>178</b>
		450	35.0	15.7	2724	2518	173
		700	36.6	25.6	4101	3712	160
		900	37.7	34.0	5118	4581	151
BXRC-35G20FD-C-8x	90	250	33.0	8.2	1555	1485	188
		375	33.6	12.6	2333	2186	185
		<b>500</b>	<b>34.3</b>	<b>17.1</b>	<b>3057</b>	<b>2858</b>	<b>178</b>
		630	34.9	22.0	3855	3531	175
		1000	36.6	36.6	5910	5295	161
		1260	37.7	47.5	7243	6405	153

Notes for Table 4:

1. Alternate drive currents in Table 4 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a  $\pm 7\%$  tolerance on flux measurements.
3. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.

## Performance at Commonly Used Drive Currents

**Table 4:** Product Performance at Commonly Used Drive Currents (Continued)

Part Number	CRI	Drive Current <sup>1</sup> (mA)	Typical $V_f$ $T_c = 25^\circ\text{C}$ (V)	Typical Power $T_c = 25^\circ\text{C}$ (W)	Typical Flux <sup>2</sup> $T_c = 25^\circ\text{C}$ (lm)	Typical DC Flux <sup>3</sup> $T_c = 65^\circ\text{C}$ (lm)	Typical Efficacy $T_c = 25^\circ\text{C}$ (lm/W)
BXRC-40G20FD-B-8x	90	175	33.0	5.8	1088	1050	188
		260	33.6	8.7	1618	1534	185
		<b>350</b>	<b>34.3</b>	<b>12.0</b>	<b>2165</b>	<b>2024</b>	<b>180</b>
		450	35.0	15.7	2754	2546	175
		700	36.6	25.6	4145	3752	162
		900	37.7	34.0	5174	4631	152
BXRC-40G20FD-C-8x	90	250	33.0	8.2	1567	1496	190
		375	33.6	12.6	2351	2203	186
		<b>500</b>	<b>34.3</b>	<b>17.1</b>	<b>3081</b>	<b>2881</b>	<b>180</b>
		630	34.9	22.0	3886	3559	177
		1000	36.6	36.6	5956	5336	163
		1260	37.7	47.5	7299	6455	154

Notes for Table 4:

1. Alternate drive currents in Table 4 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a  $\pm 7\%$  tolerance on flux measurements.
3. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.



# Electrical Characteristics

**Table 5:** Electrical Characteristics

Part Number	Drive Current (mA)	Forward Voltage Pulsed, $T_c = 25^{\circ}\text{C}$ (V) <sup>1, 2, 3, 8</sup>			Typical Coefficient of Forward Voltage <sup>4</sup> $\Delta V_f / \Delta T_c$ (mV/ $^{\circ}\text{C}$ )	Typical Thermal Resistance Junction to Case <sup>5,6</sup> $R_{j-c}$ ( $^{\circ}\text{C}/\text{W}$ )	Driver Selection Voltages <sup>7</sup> (V)	
		Minimum	Typical	Maximum			$V_f$ Min. Hot $T_c = 105^{\circ}\text{C}$ (V)	$V_f$ Max. Cold $T_c = -40^{\circ}\text{C}$ (V)
BXRC-xxx20Fx-B-8x	350	32.2	34.3	36.3	-11	0.22	31.4	37.1
	900	35.5	37.7	40.0	-12	0.34	34.6	40.8
BXRC-xxx20Fx-C-8x	500	32.2	34.3	36.3	-11	0.19	31.4	37.1
	1260	35.4	37.7	39.9	-12	0.29	34.6	40.7

Notes for Table 5:

- Parts are tested in pulsed conditions,  $T_c = 25^{\circ}\text{C}$ . Pulse width is 10ms.
- Voltage minimum and maximum are provided for reference only and are not a guarantee of performance.
- Bridgelux maintains a tester tolerance of  $\pm 0.10\text{V}$  on forward voltage measurements.
- Typical coefficient of forward voltage tolerance is  $\pm 0.1\text{mV}$  for nominal current.
- Thermal resistance values are based from test data of a 3000K 80 CRI product.
- Thermal resistance value was calculated using total electrical input power; optical power was not subtracted from input power. The thermal interface material used during testing is not included in the thermal resistance value.
- $V_f$  min hot and max cold values are provided as reference only and are not guaranteed by test. These values are provided to aid in driver design and selection over the operating range of the product.
- This product has been designed and manufactured per IEC 62031:2018. This product has passed dielectric withstand voltage testing at 1160 V. The working voltage designated for the insulation is 80V d.c. The maximum allowable voltage across the array must be determined in the end product application.

# Eye Safety

**Table 6:** Eye Safety Risk Group (RG) Classifications

Part Number	Drive Current (mA)	CCT <sup>3</sup>	
		2700K/3000K	3500K-5000K <sup>2</sup>
BXRC-xxx20Fx-B-8x	710	RG1	RG1
	900	RG1	RG2
BXRC-xxx20Fx-C-8x	740	RG1	RG1
	1260	RG1	RG2

Notes for Table 6:

1. Eye safety classification for the use of Bridgelux Vero SE LED arrays is in accordance with specification IEC/TR 62778: Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires.
2. For products classified as RG2 at 5000K Ethr= 1530 lx.
3. Please contact your Bridgelux sales representative for Ethr values at specific drive currents and CCTs not listed.

# Absolute Maximum Ratings

**Table 7:** Maximum Ratings

Parameter	Maximum Rating	
LED Junction Temperature ( $T_j$ )	150°C	
Storage Temperature <sup>1</sup>	-40°C to +95°C	
Operating Case Temperature <sup>2</sup> ( $T_c$ )	95°C	
Soldering Temperature <sup>3</sup>	350°C or lower for a maximum of 6 seconds	
	BXRC-xxx20Fx-B-8x	BXRC-xxx20Fx-C-8x
Maximum Drive Current <sup>4</sup>	900 mA at $\leq 85^\circ\text{C}$ 675 mA at $95^\circ\text{C}$	1260 mA at $\leq 85^\circ\text{C}$ 945 mA at $95^\circ\text{C}$
Maximum Peak Pulsed Drive Current <sup>5</sup>	1290 mA	1800 mA
Maximum Reverse Voltage <sup>6</sup>	-60V	-60V

Notes for Table 7:

1. The F90 product is robust enough to pass our internal humidity test but it is still more sensitive compared to regular LED array product. The product needs to be stored in a dry environment. It is not recommended to use the product in a damp environment that directly exposes it to moisture.
2. For IEC 62717 requirement, please consult your Bridgelux sales representative.
3. Refer to Bridgelux Application Note AN31: Assembly Considerations for Bridgelux Vero LED Arrays.
4. Arrays may be driven at higher currents however lumen maintenance may be reduced and warranty will not apply.
5. Bridgelux recommends a maximum duty cycle of 10% and pulse width of 20 ms when operating LED Arrays at maximum peak pulsed current specified. Maximum peak pulsed currents indicate values where LED Arrays can be driven without catastrophic failures.
6. Light emitting diodes are not designed to be driven in reverse voltage and will not produce light under this condition. Maximum rating provided for reference only.

# Performance Curves

Figure 1: Vero13B Drive Current vs. Voltage

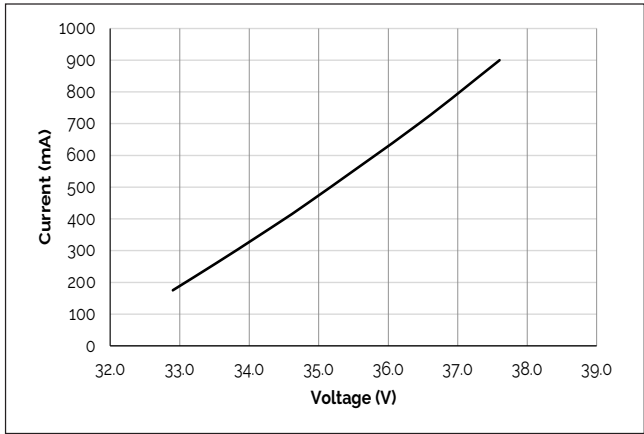


Figure 2: Vero13C Drive Current vs. Voltage

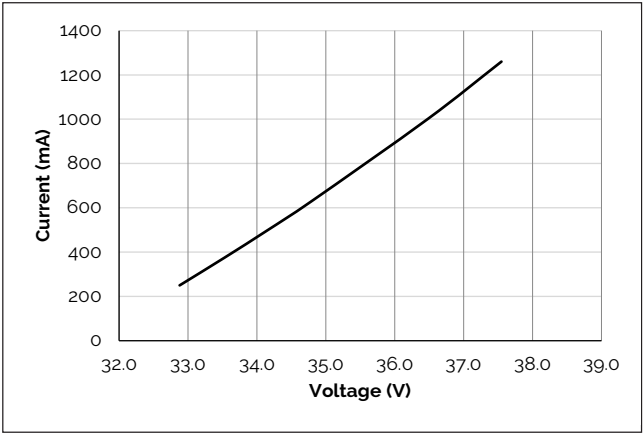


Figure 3: Vero13B Typical Relative Flux vs. Current

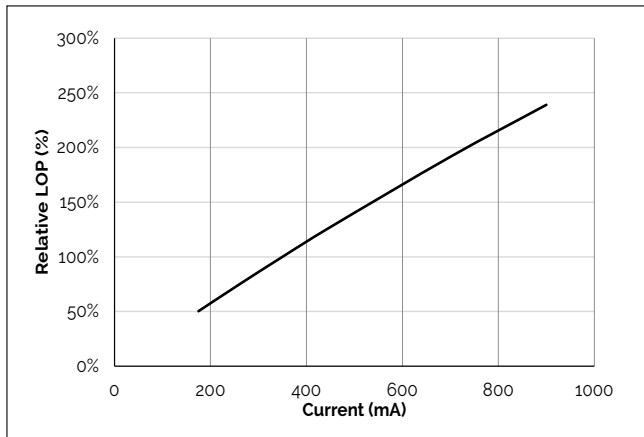


Figure 4: Vero13C Typical Relative Flux vs. Current

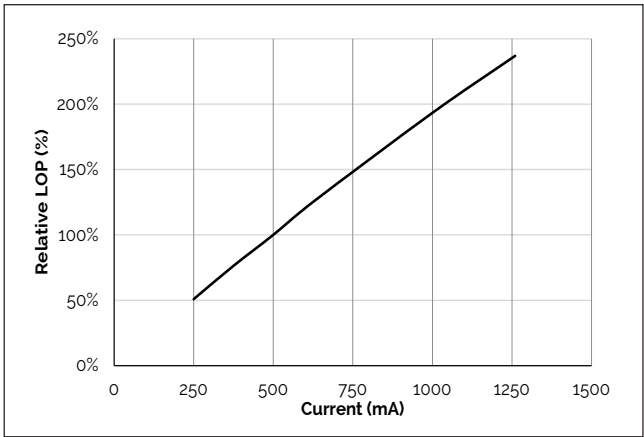


Figure 5: Typical DC Flux vs. Case Temperature

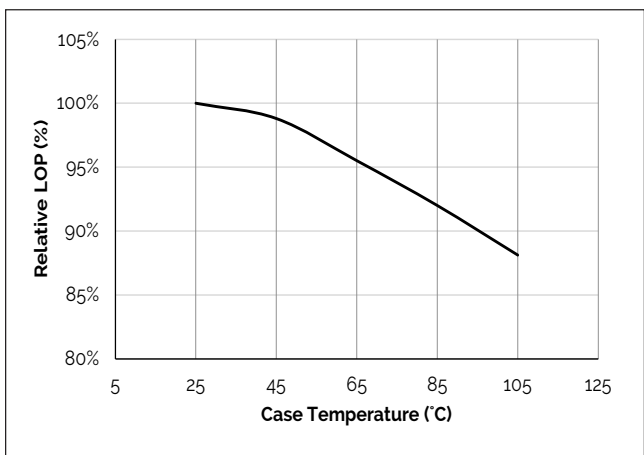
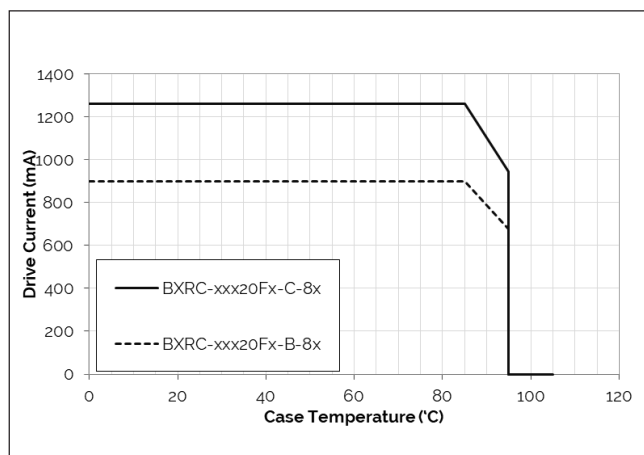


Figure 6: Derating Curve



Notes for Figures 1-4:

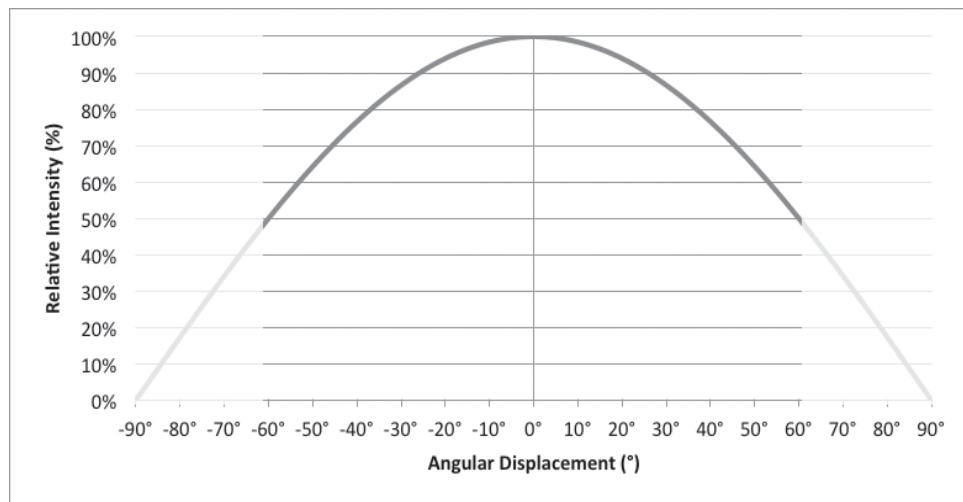
1. Bridgelux does not recommend driving high power LEDs at low currents. Doing so may produce unpredictable results. Pulse width modulation (PWM) is recommended for dimming effects.
2. Products tested under pulsed condition (10ms pulse width) at nominal drive current where  $T_j$  (junction temperature) =  $T_c$  (case temperature) = 25°C.

Note for Figures 5-6:

1. Characteristics shown for Warm White.

# Typical Radiation Pattern

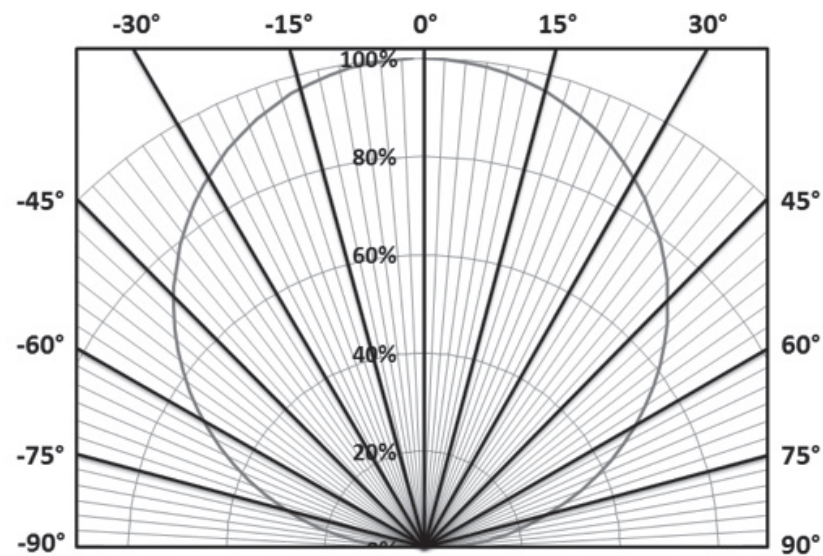
**Figure 7: Typical Spatial Radiation Pattern**



Notes for Figure 7:

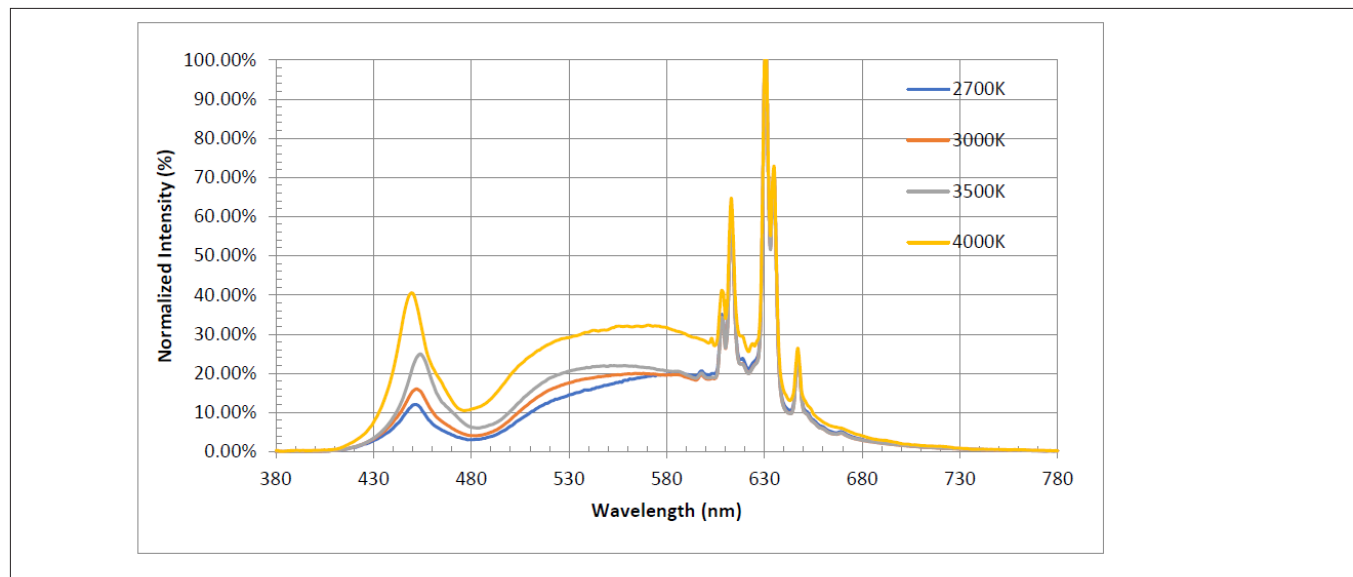
1. Typical viewing angle is 120°.
2. The viewing angle is defined as the off axis angle from the centerline where intensity is  $\frac{1}{2}$  of the peak value.

**Figure 8: Typical Polar Radiation Pattern**



# Typical Color Spectrum

Figure 9: Typical Color Spectrum

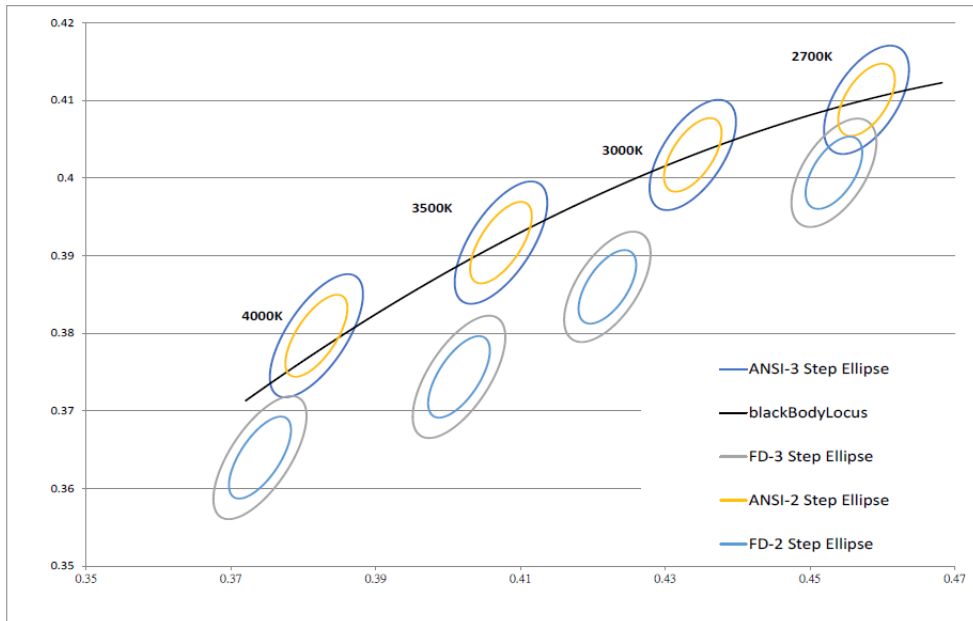


Notes for Figure 9:

1. Color spectra measured at nominal current for  $T_j = T_c = 65^\circ\text{C}$ .
2. Color spectra shown is 2700K and 90CRI.
3. Color spectra shown is 3000K and 90 CRI.
4. Color spectra shown is 3500K and 90 CRI.
5. Color spectra shown is 4000K and 90 CRI.

# Color Binning Information

**Figure 10: Warm and Neutral White Test Bins in xy Color Space**



Note: Pulsed Test Conditions, T<sub>c</sub> = 65°C

**Table 8:** Warm and Neutral White xy Bin Coordinates and Associated Typical CCT (product is not targeted to T<sub>c</sub> = 65°C)

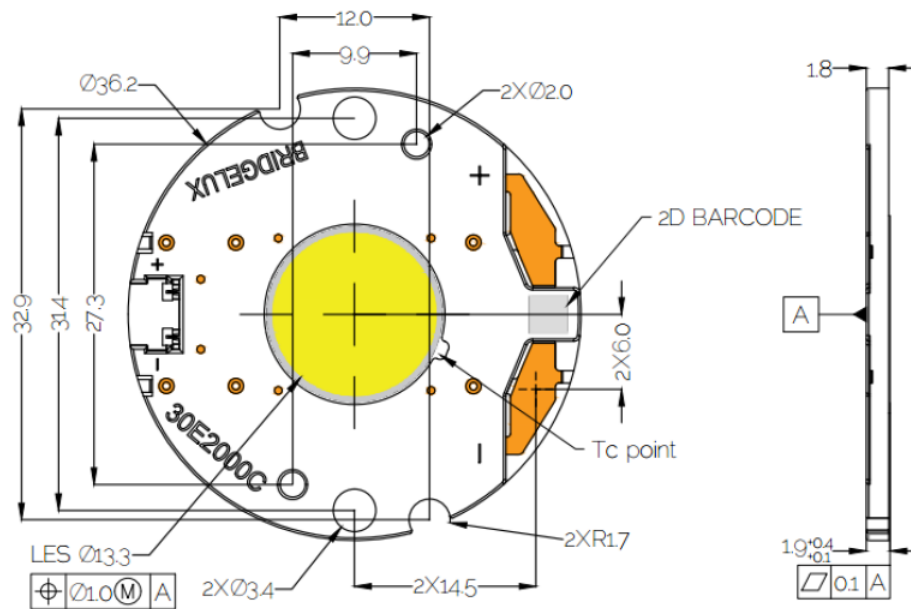
Bin Code	2700K	3000K	3500K	4000K
ANSI Bin (for reference only)	(2580K - 2870K)	(2870K - 3220K)	(3220K - 3710K)	(3710K - 4260K)
83 (3 SDCM)	(2645K - 2788K)	(3025K - 3210K)	(3333K - 3567K)	(3935K - 4254K)
82 (2 SDCM)	(2668K - 2764K)	(3055K - 3178K)	(3370K - 3526K)	(3985K - 4197K)
Center Point (x,y)	(0.4533, 0.4007)	(0.422 0.386)	(0.4015 0.3744)	(0.374, 0.364)

Note for Tables 8:

1. Bridgelux maintains a tolerance of +/- 0.007 on x and y color coordinates in the CIE 1931 color Space.

# Mechanical Dimensions

**Figure 11: Drawing for Vero13 LED Array**



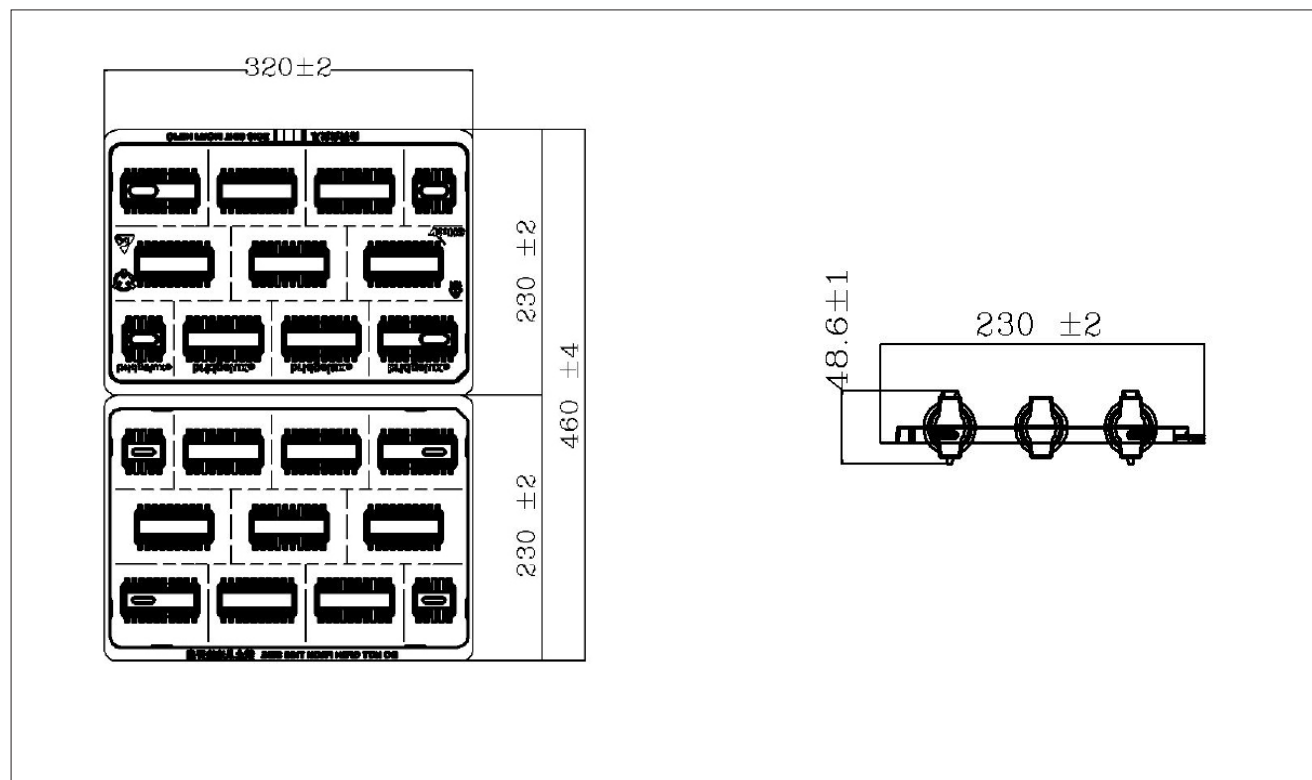
Notes for Figure 11:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are  $\pm 0.1\text{mm}$ .
4. Mounting holes (2X) are for M2.5 screws.
5. Bridgelux recommends two tapped holes for mounting screws with  $31.4 \pm 0.10\text{mm}$  center-to-center spacing.
6. Screws with flat shoulders (pan, dome, button, round, truss, mushroom) provide optimal torque control. Do NOT use flat, countersink, or raised head screws.
7. Solder pads and connector port are labeled "+" and "-" to denote positive and negative, respectively.
8. It is not necessary to provide electrical connections to both the solder pads and the connector port. Either set may be used depending on application specific design requirements.
9. Refer to Application Notes AN30 and AN31 for product handling, mounting and heat sink recommendations.
10. The optical center of the LED Array is nominally defined by the mechanical center of the array to a tolerance of  $\pm 0.2\text{mm}$ .
11. Bridgelux maintains a flatness of  $0.10\text{mm}$  across the mounting surface of the array.



# Packaging and Labeling

Figure 12: Drawing for Vero 13 Packaging Tray

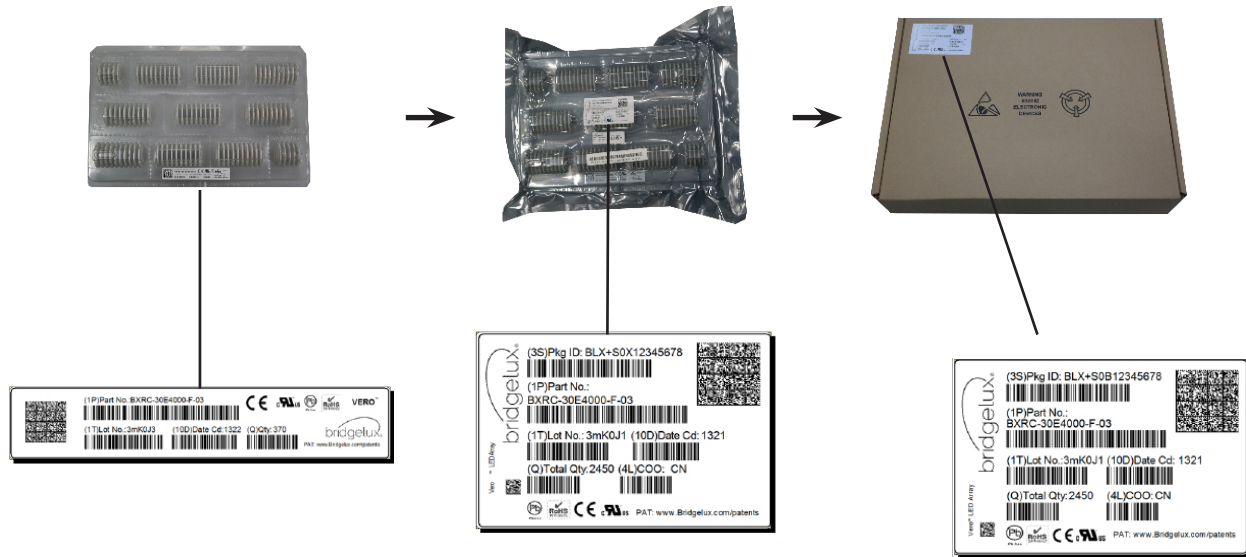


Notes for Figure 12:

1. Dimensions are in millimeters.
2. Drawings are not to scale.

# Packaging and Labeling

**Figure 13: Vero Series Packaging and Labeling**



Notes for Figure 13:

1. Each tray holds 100 COBs.
2. Each tray is vacuum sealed in an anti-static bag and placed in its own box.
3. Each tray, bag and box is to be labeled as shown above.

**Figure 14: Product Labeling**

Bridgelux COB arrays have laser markings on the back side of the substrate to help with product identification. In addition to the product identification markings, Bridgelux COB arrays 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 COB array.



# Design Resources

## Application Notes

Bridgelux has developed a comprehensive set of application notes and design resources to assist customers in successfully designing with the Vero product family of LED array products. For all available application notes visit [www.bridgelux.com](http://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](http://www.bridgelux.com).

## 3D CAD Models

Three dimensional CAD models depicting the product outline of all Bridgelux Vero LED arrays are available in both IGS and STEP formats. Please contact your Bridgelux sales representative for assistance.

## LM80

LM80 testing has been completed and the LM80 report is now available. Please contact your Bridgelux sales representative for LM-80 report.

# Precautions

## CAUTION: CHEMICAL EXPOSURE HAZARD

Exposure to some chemicals commonly used in luminaire manufacturing and assembly can cause damage to the LED array. Please consult Bridgelux Application Note AN31 for additional information.

## CAUTION: RISK OF BURN

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

## CAUTION: AVOID MOISTURE

The product is sensitive to moisture. It is not recommended for use in outdoor application or damp environment.

## CAUTION

### CONTACT WITH LIGHT EMITTING SURFACE (LES)

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

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 plastic housing of the Vero LED array. Use the mechanical features of the LED array housing, edges and/or mounting holes to locate and secure optical devices as needed.

# Disclaimers

## 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.

## STANDARD TEST CONDITIONS

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

# About Bridgelux: Bridging Light and Life™

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**

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