



Bridgelux® Gen 8 Vg HD LED Array

Product Data Sheet DS408



Introduction

V Series HD



V Series™ HD LED array product, an ultra-high lumen density COB product line, is designed for high intensity spotlights used in commercial and retail settings. V Series HD arrays offer industry leading color over angle uniformity, and replace ceramic metal halide lamps by providing equal or greater center beam candle power at lower power and at greater lifetimes. Their tight beam control and exceptional quality of light is well suited for demanding directional spot applications.

The Vg HD LED array is available in a variety of CCT and CRI combinations providing substantial design flexibility and energy efficiencies.

Lighting system designs incorporating these LED arrays deliver increased system level efficacy and longer service life. Typical applications include, but are not limited to, commercial and residential down lights, accent, spot and track lights.

Bridgelux Décor Series™ is our state of the art color line designed specifically for premium applications, producing unmatched LED light quality with brilliant color-rendering options and offer pleasing and inspiring lighting palettes. Bridgelux Décor Series color points are available on Vero® SE Series, Vero® Series, V Series™ and V Series™ HD.

Décor Series™ Ultra products provide a high CRI of 97 and a minimum Rg value of 91, which emphasizes the reds and color tones to which the human eye is most receptive - perfect for the most luxurious retail shops and world renowned museums. Décor Series Ultra is designed as a replacement for halogen.

Features

- Efficacy of 142 lm/W typical
- Compact high flux density light source
- Uniform high quality illumination
- Minimum 80, 90 and 95 CRI options
- Streamlined thermal path
- ENERGY STAR® / ANSI compliant color binning structure with 3 SDCM options
- More energy efficient than incandescent, halogen and fluorescent lamps
- Low voltage DC operation
- Instant light with unlimited dimming
- V_f bin code backside marking

Benefits

- Enhanced optical control
- Clean white light without pixelation
- High quality true color reproduction
- Significantly reduced thermal resistance and increased operating temperatures
- Uniform consistent white light
- Lower operating costs
- Easy to use with daylight and motion detectors to enable increased energy savings
- Reduced maintenance costs
- Environmentally friendly, no disposal issue



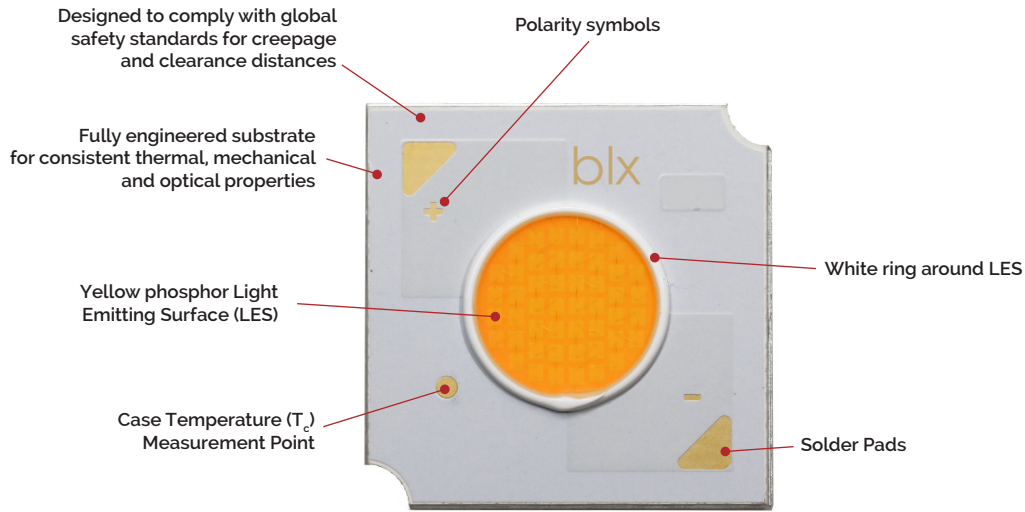
Contents

Product Feature Map	2
Product Nomenclature	2
Product Selection Guide	3
Performance at Commonly Used Drive Currents	5
Electrical Characteristics	7
Eye Safety	8
Absolute Maximum Ratings	9
Performance Curves	10
Typical Radiation Pattern	11
Typical Color Spectrum	12
Mechanical Dimensions	13
Color Binning Information	14
Packaging and Labeling	15
Design Resources	17
Precautions	17
Disclaimers	17
About Bridgelux	18

Product Feature Map

Bridgelux arrays are fully engineered devices that provide consistent thermal and optical performance on an engineered mechanical platform. The V Series HD arrays are the most compact chip-on-board devices across all of Bridgelux's LED Array products.

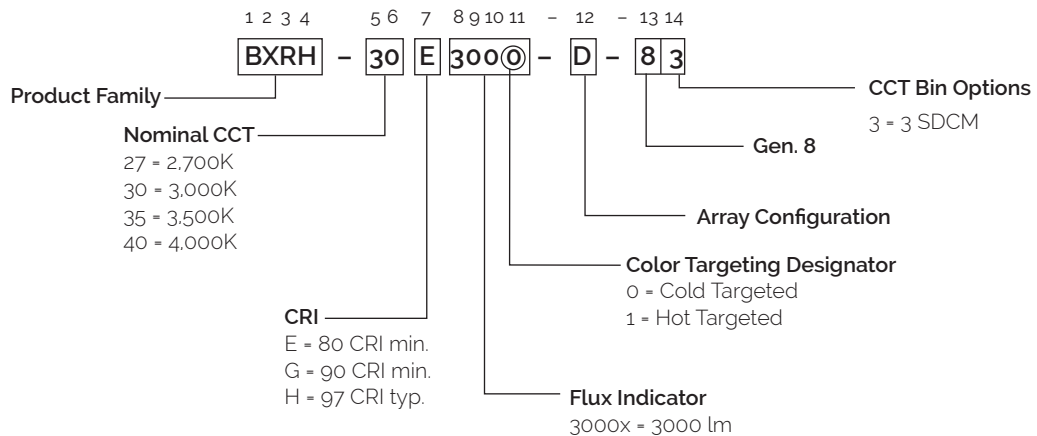
The arrays incorporate several features to simplify design integration and assembly. Please visit www.bridgelux.com for more information on the V Series HD family of products.



Note: Part number and lot codes are scribed on back of array

Product Nomenclature

The part number designation for Bridgelux V Series HD LED arrays is explained as follows:



Product Selection Guide

The following product configurations are available:

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

Part Number	Nominal CCT ¹ (K)	CRI ²	Nominal Drive Current ³ (mA)	Typical Pulsed Flux ^{4,5,6} $T_c = 25^\circ\text{C}$ (lm)	Minimum Pulsed Flux ^{6,7} $T_c = 25^\circ\text{C}$ (lm)	Typical V_f (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXRH-27E3000-D-8x	2700	80	700	3416	3075	36.6	25.6	133
BXRH-27G3000-D-8x	2700	90	700	2819	2537	36.6	25.6	110
BXRH-27H3000-D-8x	2700	97	700	2498	2248	36.6	25.6	98
BXRH-30E3000-D-8x	3000	80	700	3630	3267	36.6	25.6	142
BXRH-30G3000-D-8x	3000	90	700	2947	2652	36.6	25.6	115
BXRH-30H3000-D-8x	3000	97	700	2669	2402	36.6	25.6	104
BXRH-35E3000-D-8x	3500	80	700	3715	3344	36.6	25.6	145
BXRH-35G3000-D-8x	3500	90	700	3053	2748	36.6	25.6	119
BXRH-35H3000-D-8x	3500	97	700	2744	2469	36.6	25.6	107
BXRH-40E3000-D-8x	4000	80	700	3737	3363	36.6	25.6	146
BXRH-40G3000-D-8x	4000	90	700	3118	2806	36.6	25.6	122
BXRH-40H3000-D-8x	4000	97	700	2819	2537	36.6	25.6	110

Notes for Table 1:

- Nominal CCT as defined by ANSI C78.377-2011.
- CRI values are typical for Decor Series Ultra and Decor Series Class A products. CRI values are minimums for all other products. Minimum Rg value for 80 CRI products is 0, the minimum Rg values for 90 CRI products is 50, the minimum Rg values for 97 CRI products is 91. Bridgelux maintains a ± 3 tolerance on CRI and Rg values.
- Drive current is referred to as nominal drive current.
- Products tested under pulsed condition (10ms pulse width) at nominal test current where T_j (junction temperature) = T_c (case temperature) = 25°C .
- Typical performance values are provided as a reference only and are not a guarantee of performance.
- Bridgelux maintains a $\pm 7\%$ tolerance on flux measurements.
- Minimum flux values at the nominal test current are guaranteed by 100% test.

Product Selection Guide

Table 2: Selection Guide, Stabilized DC Performance ($T_c = 85^\circ\text{C}$)

Part Number	Nominal CCT ¹ (K)	CRI ²	Nominal Drive Current ³ (mA)	Typical DC Flux ^{4,5} $T_c = 85^\circ\text{C}$ (lm)	Minimum DC Flux ⁶ $T_c = 85^\circ\text{C}$ (lm)	Typical V_f (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXRH-27E3000-D-8x	2700	80	700	3075	2767	35.4	24.8	124
BXRH-27G3000-D-8x	2700	90	700	2537	2283	35.4	24.8	102
BXRH-27H3000-D-8x	2700	97	700	2248	2024	35.4	24.8	91
BXRH-30E3000-D-8x	3000	80	700	3267	2940	35.4	24.8	132
BXRH-30G3000-D-8x	3000	90	700	2652	2387	35.4	24.8	107
BXRH-30H3000-D-8x	3000	97	700	2402	2162	35.4	24.8	97
BXRH-35E3000-D-8x	3500	80	700	3344	3009	35.4	24.8	135
BXRH-35G3000-D-8x	3500	90	700	2748	2473	35.4	24.8	111
BXRH-35H3000-D-8x	3500	97	700	2469	2223	35.4	24.8	100
BXRH-40E3000-D-8x	4000	80	700	3363	3027	35.4	24.8	136
BXRH-40G3000-D-8x	4000	90	700	2806	2525	35.4	24.8	113
BXRH-40H3000-D-8x	4000	97	700	2537	2283	35.4	24.8	102

Notes for Table 2:

- Nominal CCT as defined by ANSI C78.377-2011.
- All CRI values are measured at $T_j = T_c = 25^\circ\text{C}$. CRI values are typical for Decor Series Ultra and Decor Series Class A products. CRI values are minimums for all other products. Minimum Rg value for 80 CRI products is 0, the minimum Rg values for 90 CRI products is 50, the minimum Rg values for 97 CRI products is 91. Bridgelux maintains a ± 3 tolerance on CRI and Rg values.
- Drive current is referred to as nominal drive current.
- Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.
- Typical performance is estimated based on operation under DC (direct current) with LED array mounted onto a heat sink with thermal interface material and the case temperature maintained at 85°C . Based on Bridgelux test setup, values may vary depending on the thermal design of the luminaire and/or the exposed environment to which the product is subjected.
- Minimum flux values at elevated temperatures are provided for reference only and are not guaranteed by 100% production testing. Based on Bridgelux test setup, values may vary depending on the thermal design of the luminaire and/or the exposed environment to which the product is subjected.

Performance at Commonly Used Drive Currents

V Series HD LED arrays are tested to the specifications shown using the nominal drive currents in Table 1. V Series HD LED arrays 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 Figure 1 and the flux vs. current characteristics shown in Figure 2. The performance at commonly used drive currents is summarized in Table 3.

Table 3: Product Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_c = 25^\circ\text{C}$ (V)	Typical Power $T_c = 25^\circ\text{C}$ (W)	Typical Flux ² $T_c = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_c = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_c = 25^\circ\text{C}$ (lm/W)
BXRH-27E3000-D-8x	80	350	34.2	12.0	1813	1632	151
		500	35.3	17.7	2525	2272	143
		700	36.6	25.6	3416	3075	133
		875	37.7	33.0	4149	3734	126
		960	38.2	36.7	4487	4038	122
		1200	39.5	47.4	5379	4841	114
BXRH-27G3000-D-8x	90	350	34.2	12.0	1496	1346	125
		500	35.3	17.7	2083	1875	118
		700	36.6	25.6	2819	2537	110
		875	37.7	33.0	3423	3081	104
		960	38.2	36.7	3702	3331	101
		1200	39.5	47.4	4438	3994	94
BXRH-27H3000-D-8x	97	350	34.2	12.0	1326	1193	111
		500	35.3	17.7	1846	1662	105
		700	36.6	25.6	2498	2248	98
		875	37.7	33.0	3034	2731	92
		960	38.2	36.7	3281	2953	89
		1200	39.5	47.4	3933	3540	83
BXRH-30E3000-D-8x	80	350	34.2	12.0	1927	1734	161
		500	35.3	17.7	2683	2414	152
		700	36.6	25.6	3630	3267	142
		875	37.7	33.0	4408	3968	133
		960	38.2	36.7	4767	4290	130
		1200	39.5	47.4	5715	5143	121
BXRH-30G3000-D-8x	90	350	34.2	12.0	1564	1408	131
		500	35.3	17.7	2178	1960	123
		700	36.6	25.6	2947	2652	115
		875	37.7	33.0	3579	3221	108
		960	38.2	36.7	3870	3483	105
		1200	39.5	47.4	4639	4175	98
BXRH-30H3000-D-8x	97	350	34.2	12.0	1417	1275	118
		500	35.3	17.7	1972	1775	112
		700	36.6	25.6	2669	2402	104
		875	37.7	33.0	3241	2917	98
		960	38.2	36.7	3505	3155	96
		1200	39.5	47.4	4202	3782	89

Notes for Table 3:

1. Alternate drive currents 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 3: Product Performance at Commonly Used Drive Currents (continued)

Part Number	CRI	Drive Current ¹ (mA)	Typical V _f T _c = 25°C (V)	Typical Power T _c = 25°C (W)	Typical Flux ² T _c = 25°C (lm)	Typical DC Flux ³ T _c = 85°C (lm)	Typical Efficacy T _c = 25°C (lm/W)
BXRH-35E3000-D-8x	80	350	34.2	12.0	1972	1775	165
		500	35.3	17.7	2746	2471	156
		700	36.6	25.6	3715	3344	145
		875	37.7	33.0	4512	4061	137
		960	38.2	36.7	4879	4391	133
		1200	39.5	47.4	5849	5265	123
BXRH-35G3000-D-8x	90	350	34.2	12.0	1621	1459	135
		500	35.3	17.7	2257	2031	128
		700	36.6	25.6	3053	2748	119
		875	37.7	33.0	3708	3337	112
		960	38.2	36.7	4010	3609	109
		1200	39.5	47.4	4807	4327	101
BXRH-35H3000-D-8x	97	350	34.2	12.0	1456	1311	122
		500	35.3	17.7	2028	1825	115
		700	36.6	25.6	2744	2469	107
		875	37.7	33.0	3332	2999	101
		960	38.2	36.7	3603	3243	98
		1200	39.5	47.4	4320	3888	91
BXRH-40E3000-D-8x	80	350	34.2	12.0	1983	1785	166
		500	35.3	17.7	2761	2485	156
		700	36.6	25.6	3737	3363	146
		875	37.7	33.0	4538	4084	137
		960	38.2	36.7	4907	4417	134
		1200	39.5	47.4	5883	5295	124
BXRH-40G3000-D-8x	90	350	34.2	12.0	1655	1489	138
		500	35.3	17.7	2304	2073	130
		700	36.6	25.6	3118	2806	122
		875	37.7	33.0	3786	3407	115
		960	38.2	36.7	4094	3685	112
		1200	39.5	47.4	4908	4417	104
BXRH-40H3000-D-8x	97	350	34.2	12.0	1496	1346	125
		500	35.3	17.7	2083	1875	118
		700	36.6	25.6	2819	2537	110
		875	37.7	33.0	3423	3081	104
		960	38.2	36.7	3702	3331	101
		1200	39.5	47.4	4438	3994	94

Notes for Table 3:

1. Alternate drive currents in Table 3 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a ± 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 4: Electrical Characteristics

Part Number	Drive Current (mA)	Forward Voltage Pulsed, $T_c = 25^\circ\text{C}$ (V) ^{1, 2, 3, 8}			Typical Coefficient of Forward Voltage ⁴ $\Delta V_f / \Delta T_c$ (mV/ $^\circ\text{C}$)	Typical Thermal Resistance Junction to Case ^{5,6} R_{j-c} ($^\circ\text{C}/\text{W}$)	Driver Selection Voltages ⁷ (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)
BXRH-xxx300x-D-8x	700	33.9	36.6	39.3	-20.00	0.55	32.3	40.6
	1200	36.5	39.5	42.5	-21.58	0.66	34.8	43.9

Notes for Table 4:

- 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 500 V. The working voltage designated for the insulation is 50V d.c. The maximum allowable voltage across the array must be determined in the end product application.

Eye Safety

Table 5: Eye Safety Risk Group (RG) Classifications

Part Number	Drive Current (mA)	CCT ⁴	
		2700K/3000K ²	4000K ³
BXRH-xxx300x-D-8x	700	RG1	RG2
	1200	RG2	RG2

Notes for Table 5:

1. Eye safety classification for the use of Bridgelux V Series HD 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 3000K, $E_{thr} = 2670$ lx.
3. For products classified as RG2 at 4000K, $E_{thr} = 1760$ lx.
4. Please contact your Bridgelux sales representative for E_{thr} values at specific drive currents and CCTs not listed.

Absolute Maximum Ratings

Table 6: Maximum Ratings

Parameter	Maximum Rating
LED Junction Temperature (T_j)	125°C
Storage Temperature	-40°C to +105°C
Operating Case Temperature ¹ (T_c)	105°C
Soldering Temperature ²	300°C or lower for a maximum of 6 seconds
	BXRH-xxx300x-D-8x
Maximum Drive Current ³	1200 mA
Maximum Peak Pulsed Drive Current ⁴	1360 mA
Maximum Reverse Voltage ⁵	-60V

Notes for Table 6:

1. For IEC 62717 requirement, please consult your Bridgelux sales representative.
2. Refer to Bridgelux Application Note AN101: Handling and Assembly of Bridgelux V Series LED Arrays.
3. Arrays may be driven at higher currents however lumen maintenance may be reduced and warranty will not apply.
4. 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.
5. 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: V_{gD} HD Drive Current vs. Voltage ($T_j = T_c = 25^\circ\text{C}$)¹

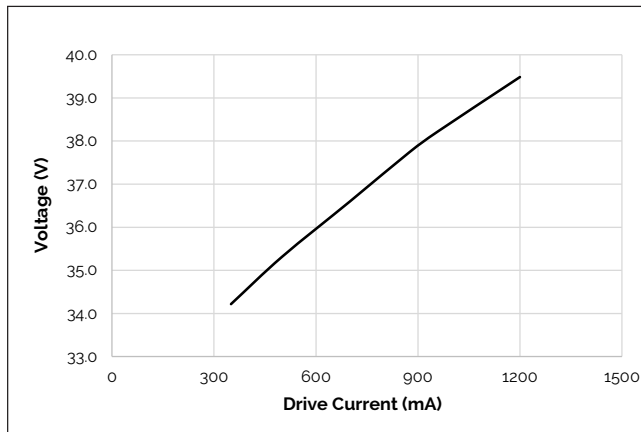


Figure 2: V_{gD} HD Typical Relative Luminous Flux vs. Drive Current ($T_j = T_c = 25^\circ\text{C}$)¹

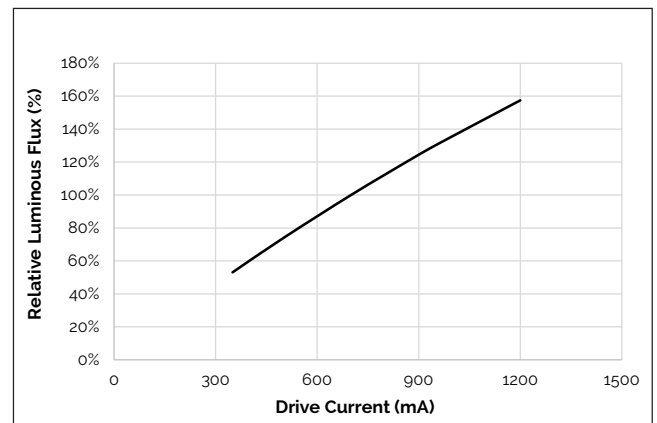


Figure 3: Typical DC Flux vs. Case Temperature

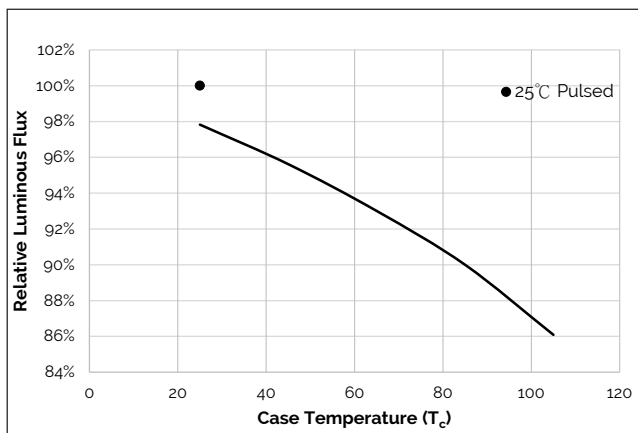


Figure 4: Typical DC c_{cx} Shift vs. Case Temperature

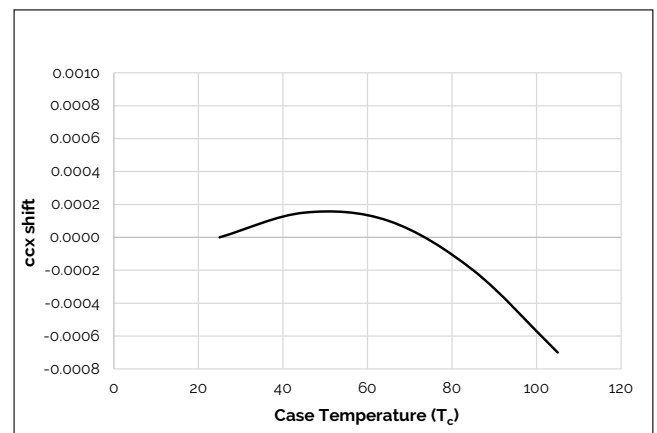


Figure 5: Typical DC c_{cy} Shift vs. Case Temperature

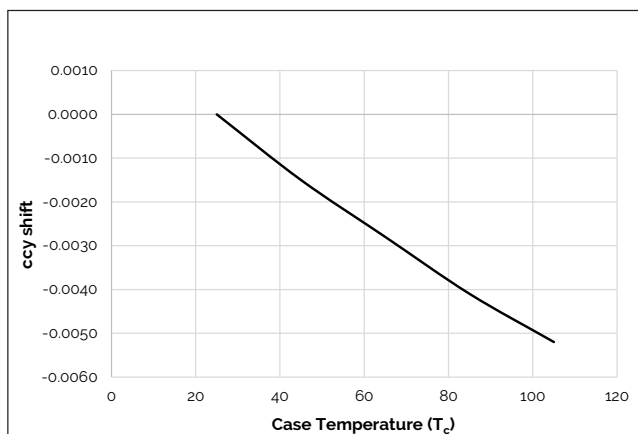
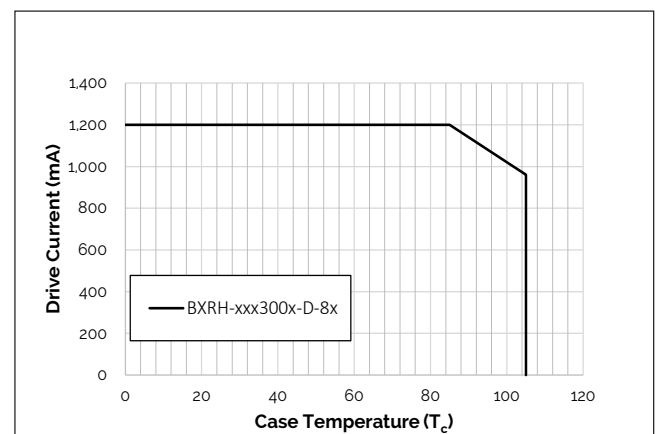


Figure 6: Derating Curve

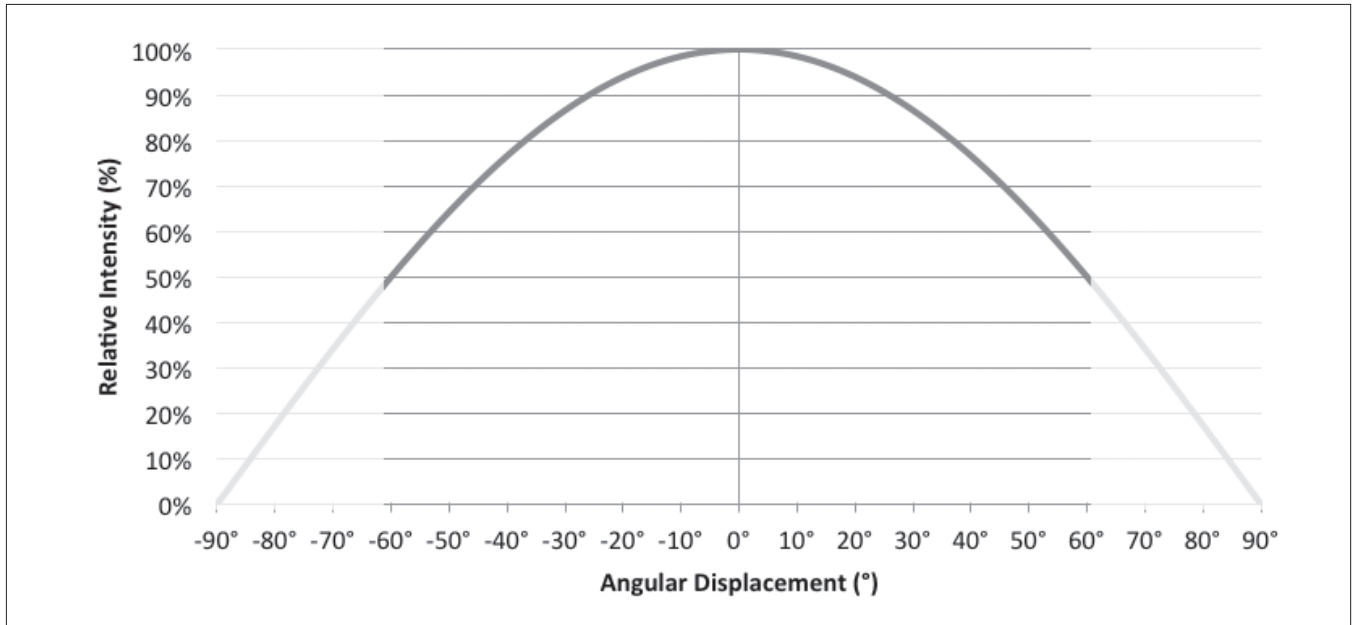


Notes for Figures 1 - 4:

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. Characteristics shown for 3000K and 90 CRI.

Typical Radiation Pattern

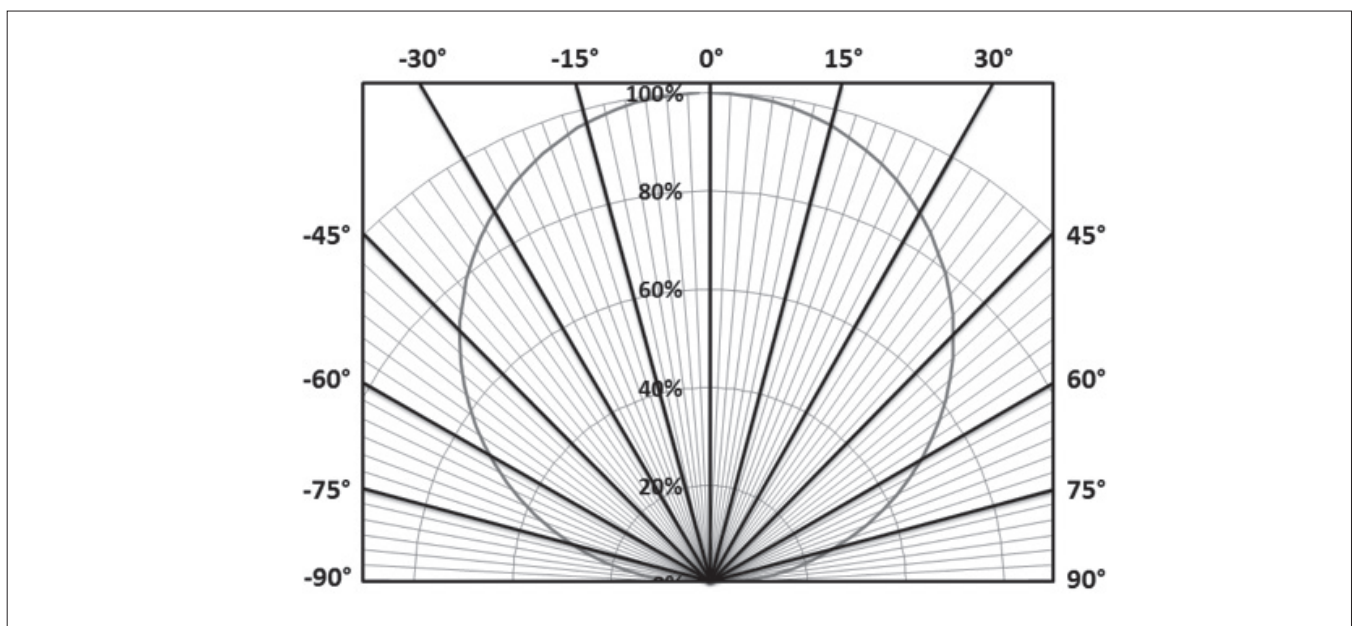
Figure 7: Typical Spatial Radiation Pattern



Notes for Figure 7:

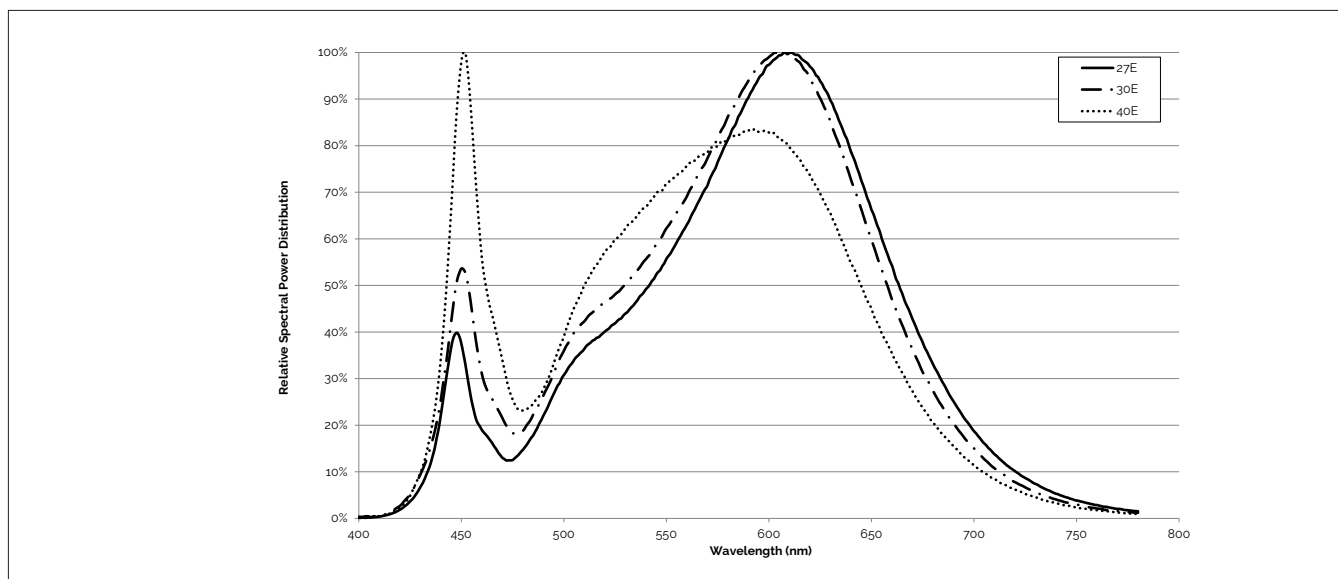
1. Typical viewing angle is 120°.
2. The viewing angle is defined as the off axis angle from the centerline where intensity is ½ of the peak value.

Figure 8: Typical Polar Radiation Pattern



Typical Color Spectrum

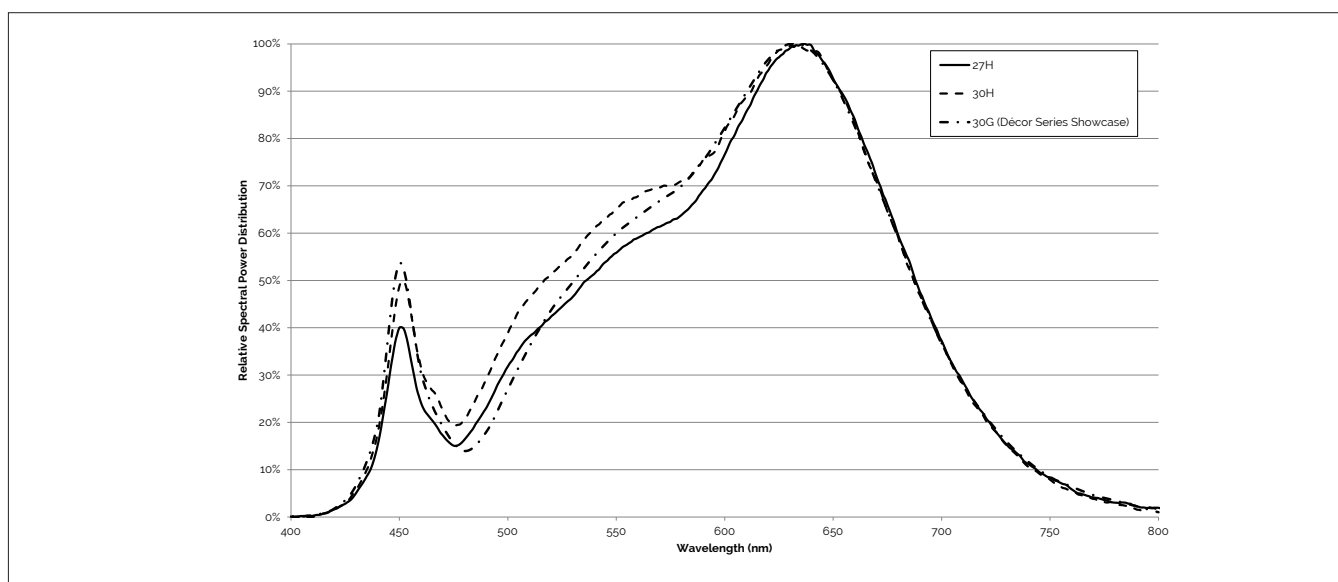
Figure 9: Typical Color Spectrum



Notes for Figure 9:

1. Color spectra measured at nominal current for $T_j = T_c = 25^\circ\text{C}$.
2. Color spectra shown is 2700K and 80 CRI.
3. Color spectra shown is 3000K and 80 CRI.
4. Color spectra shown is 4000K and 80 CRI.

Figure 10: Typical Color Spectrum for Décor Series

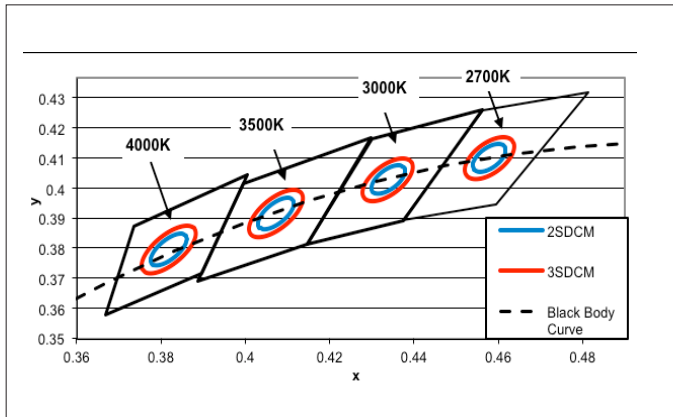


Note for Figure 10:

1. Color spectra measured at nominal current for $T_j = T_c = 25^\circ\text{C}$.

Color Binning Information

Figure 12: Warm and Neutral White Test Bins in xy Color Space



Note: Pulsed Test Conditions, $T_c = 25^\circ\text{C}$

Table 7: Warm and Neutral White xy Bin Coordinates and Associated Typical CCT

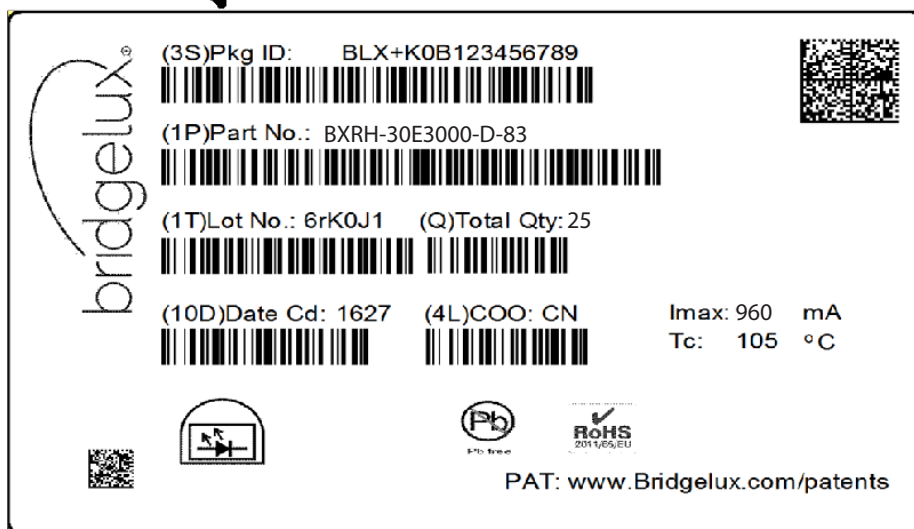
Bin Code	2700K	3000K	3500K	4000K
ANSI Bin (for reference only)	(2580K - 2870K)	(2870K - 3220K)	(3220K - 3710K)	(3710K - 4260K)
83 (3 SDCM)	(2651K - 2794K)	(2968K - 3136K)	(3369K - 3586K)	(3851K - 4130K)
82 (2 SDCM)	(2674K - 2769K)	(2995K - 3107K)	(3404K - 3548K)	(3895K - 4081K)
Center Point (x,y)	(0.4578, 0.4101)	(0.4338, 0.403)	(0.4073, 0.3917)	(0.3818, 0.3797)

Note for Table 7:

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

Packaging and Labeling

Figure 13: Vg HD Packaging Tube



Box Label

Commercial Invoice
and Packing list



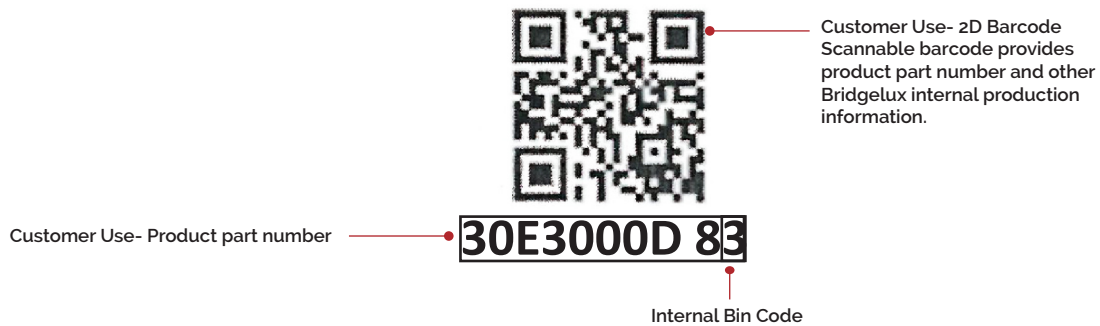
Notes for Figure 13:

1. Each tube holds 25 Vg HD COB arrays.
2. One tube is sealed in an anti-static bag. Four bags are placed in a shipping box. Depending on quantities ordered, a bigger shipping box, containing four boxes may be used to ship products.
3. Each bag and box is to be labeled as shown above.
4. Dimensions for each tube are 21.3 (W) x 9.5 (H) x 505 (L) mm. Dimensions for the anti-static bag are 100 (W) x 625 (L) x 0.075 (T) mm. Dimensions for the shipping box are 58.7 x 13.3 x 7.9 cm

Packaging and Labeling

Figure 14: V Series HD 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 V Series product family of LED array products. For all available application notes 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 V Series HD 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 representatives 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 AN101 for additional information.

CAUTION: RISK OF BURN

Do not touch the V Series HD LED array during operation. Allow the array to cool for a sufficient period of time before handling. The V Series HD LED array 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 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).

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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