Bridgelux® GEN8 V3 HD LED Array

Product Data Sheet DS435

FIVE YEAR Warranty™

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 V3 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 R9 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 101 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

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

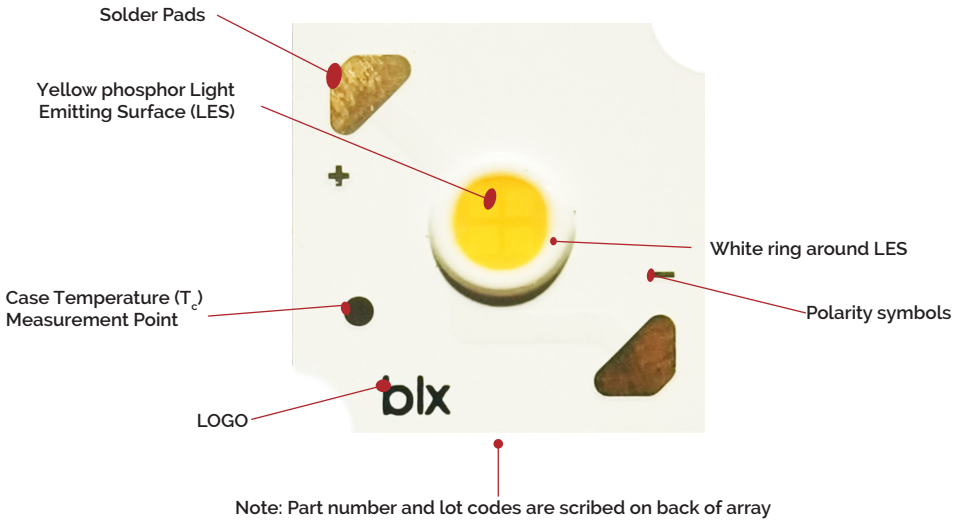
Pb free RoHS

Contents

Product Feature Map

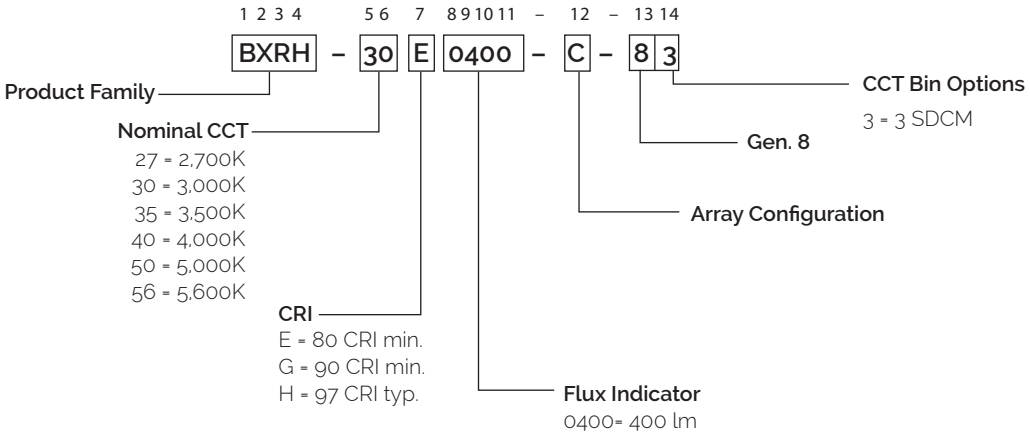
Bridgelux arrays are fully engineered devices that provide consistent thermal and optical performance on an engineered mechanical platform. The V Series HD arrays are the most compact chip-on-board devices across all of Bridgelux's LED Array products.

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.



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˚C)

Part Number	Nominal CCT[1] (K)	CRI[2]	Nominal Drive Current[3] (mA)	Typical Pulsed Flux[4,5,6] T_c = 25°C (lm)	Minimum Pulsed Flux[6,7] T_c = 25°C (lm)	Typical V_f (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXRH-27E0400-C-83	2700K	80	350	397	357	11.9	4.2	95
BXRH-27G0400-C-83	2700K	90	350	340	306	11.9	4.2	82
BXRH-27H0400-C-83	2700K	95	350	290	261	11.9	4.2	70
BXRH-30E0400-C-83	3000K	80	350	422	379	11.9	4.2	101
BXRH-30G0400-C-83	3000K	90	350	361	325	11.9	4.2	87
BXRH-30H0400-C-83	3000K	95	350	310	279	11.9	4.2	74
BXRH-35E0400-C-83	3500K	80	350	432	389	11.9	4.2	104
BXRH-35G0400-C-83	3500K	90	350	355	319	11.9	4.2	85
BXRH-40E0400-C-83	4000K	80	350	434	391	11.9	4.2	104
BXRH-40G0400-C-83	4000K	90	350	362	326	11.9	4.2	87
BXRH-40H0400-C-83	4000K	95	350	328	295	11.9	4.2	79
BXRH-50E0400-C-84	5000K	80	350	439	395	11.9	4.2	105
BXRH-50G0400-C-84	5000K	90	350	380	342	11.9	4.2	91
BXRH-57E0400-C-84	5700K	80	350	422	379	11.9	4.2	101
BXRH-65E0400-C-84	6500K	80	350	427	384	11.9	4.2	102

Notes for Table 1:

1. Nominal CCT as defined by ANSI C78.377-2011.
2. CRI values are typical for Decor Series Ultra . CRI values are minimums for all other products. Minimum R9 value for 80 CRI products is 0, the minimum R9 values for 90 CRI products is 50, Minimum R9 value for 95 CRI products is 91 on 2700K and 3000K,and it is 85 on 3500K /4000K/5000K and 5700K. Bridgelux maintains a ± 3 tolerance on R9 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˚C.
5. Typical performance values are provided as a reference only and are not a guarantee of performance.
6. Bridgelux maintains a ±7% tolerance on flux measurements.

Product Selection Guide

Table 2: Selection Guide, Stabilized DC Performance (T_c = 85˚C) [4,5]

Part Number	Nominal CCT[1] (K)	CRI[2]	Nominal Drive Current[3] (mA)	Typical DC Flux[4,5] T_c = 85°C (lm)	Minimum DC Flux[6] T_c = 85°C (lm)	Typical V_f (V)	Typical Power (W)	Typical Efficacy (lm/W)
BXRH-27E0400-C-83	2700K	80	350	357	321	11.5	4.0	89
BXRH-27G0400-C-83	2700K	90	350	306	275	11.5	4.0	76
BXRH-27H0400-C-83	2700K	95	350	261	235	11.5	4.0	65
BXRH-30E0400-C-83	3000K	80	350	379	342	11.5	4.0	94
BXRH-30G0400-C-83	3000K	90	350	325	292	11.5	4.0	81
BXRH-30H0400-C-83	3000K	95	350	279	251	11.5	4.0	69
BXRH-35E0400-C-83	3500K	80	350	389	350	11.5	4.0	97
BXRH-35G0400-C-83	3500K	90	350	319	287	11.5	4.0	79
BXRH-40E0400-C-83	4000K	80	350	391	352	11.5	4.0	97
BXRH-40G0400-C-83	4000K	90	350	326	294	11.5	4.0	81
BXRH-40H0400-C-83	4000K	95	350	295	265	11.5	4.0	73
BXRH-50E0400-C-84	5000K	80	350	395	356	11.5	4.0	98
BXRH-50G0400-C-84	5000K	90	350	342	307	11.5	4.0	85
BXRH-57E0400-C-84	5700K	80	350	379	342	11.5	4.0	94
BXRH-65E0400-C-84	6500K	80	350	384	346	11.5	4.0	96

Notes for Table 2:

1. Nominal CCT as defined by ANSI C78.377-2011.
2. All CRI values are measured at T_j = T_c = 25˚C. CRI values are typical for Decor Series Ultra . CRI values are minimums for all other products. Minimum R9 value for 80 CRI products is 0, the minimum R9 values for 90 CRI products is 50, Minimum R9 value for 95 CRI products is 91 on 2700K and 3000K,and it is 85 on 3500K /4000K/5000K and 5700K. Bridgelux maintains a ± 3 tolerance on R9 values.
3. Drive current is referred to as nominal drive current.
4. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.
5. 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.
6. 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 Figures 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°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-27E0400-C-83	80	50	11.1	0.6	86	78	155
		200	11.5	2.3	243	219	106
		350	**11.9**	**4.2**	**397**	**357**	**95**
		500	12.2	6.1	532	479	87
		700	12.5	8.8	684	616	78
BXRH-27G0400-C-83	90	50	11.1	0.6	74	67	133
		200	11.5	2.3	208	188	90
		350	**11.9**	**4.2**	**340**	**306**	**82**
		500	12.2	6.1	456	410	75
		700	12.5	8.8	586	528	67
BXRH-27H0400-C-83	95	50	11.1	0.6	63	57	113
		200	11.5	2.3	178	160	77
		350	**11.9**	**4.2**	**290**	**261**	**70**
		500	12.2	6.1	389	350	64
		700	12.5	8.8	500	450	57
BXRH-30E0400-C-83	80	50	11.1	0.6	92	83	165
		200	11.5	2.3	259	233	112
		350	**11.9**	**4.2**	**422**	**380**	**101**
		500	12.2	6.1	566	509	93
		700	12.5	8.8	728	655	83
BXRH-30G0400-C-83	90	50	11.1	0.6	78	71	141
		200	11.5	2.3	221	199	96
		350	**11.9**	**4.2**	**361**	**325**	**87**
		500	12.2	6.1	484	435	79
		700	12.5	8.8	622	560	71
BXRH-30H0400-C-83	95	50	11.1	0.6	67	61	121
		200	11.5	2.3	190	171	83
		350	**11.9**	**4.2**	**310**	**279**	**74**
		500	12.2	6.1	416	374	68
		700	12.5	8.8	535	481	61
BXRH-35E0400-C-83	80	50	11.1	0.6	94	84	169
		200	11.5	2.3	265	238	115
		350	**11.9**	**4.2**	**432**	**389**	**104**
		500	12.2	6.1	579	521	95
		700	12.5	8.8	745	670	85
BXRH-35G0400-C-83	90	50	11.1	0.6	77	69	139
		200	11.5	2.3	218	196	94
		350	**11.9**	**4.2**	**355**	**320**	**85**
		500	12.2	6.1	476	428	78
		700	12.5	8.8	612	551	70

Notes for Table 3:

1. Alternate drive currents 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.

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-40E0400-C-83	80	50	11.1	0.6	94	85	170
		200	11.5	2.3	266	239	116
		350	**11.9**	**4.2**	**434**	**391**	**104**
		500	12.2	6.1	582	524	95
		700	12.5	8.8	748	673	85
BXRH-40G0400-C-83	90	50	11.1	0.6	79	71	141
		200	11.5	2.3	222	200	96
		350	**11.9**	**4.2**	**362**	**326**	**87**
		500	12.2	6.1	485	437	80
		700	12.5	8.8	624	562	71
BXRH-40H0400-C-83	95	50	11.1	0.6	71	64	128
		200	11.5	2.3	201	181	87
		350	**11.9**	**4.2**	**327**	**295**	**79**
		500	12.2	6.1	439	395	72
		700	12.5	8.8	564	508	64
BXRH-50E0400-C-84	80	50	11.1	0.6	95	86	172
		200	11.5	2.3	269	242	117
		350	**11.9**	**4.2**	**439**	**395**	**105**
		500	12.2	6.1	588	530	97
		700	12.5	8.8	757	681	86
BXRH-50G0400-C-84	90	50	11.1	0.6	83	74	148
		200	11.5	2.3	233	210	101
		350	**11.9**	**4.2**	**380**	**342**	**91**
		500	12.2	6.1	509	458	84
		700	12.5	8.8	655	590	75
BXRH-57E0400-C-84	80	50	11.1	0.6	92	83	165
		200	11.5	2.3	259	233	112
		350	**11.9**	**4.2**	**422**	**380**	**101**
		500	12.2	6.1	566	509	93
		700	12.5	8.8	728	655	83
BXRH-65E0400-C-84	90	50	11.1	0.6	93	84	167
		200	11.5	2.3	262	236	114
		350	**11.9**	**4.2**	**427**	**384**	**103**
		500	12.2	6.1	572	515	94
		700	12.5	8.8	736	663	84

Notes for Table 3:

1. Alternate drive currents 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°C (V) [1, 2, 3,]			Typical Coefficient of Forward Voltage[4] $\Delta V_f/\Delta T_c$ (mV/°C)	Typical Thermal Resistance Junction to Case[5,6] R_{j-c} (°C/W)
		Minimum	Typical	Maximum		
BXRH-xxx0400-C-8x	350	11.0	11.9	12.8	-7.85	5

Notes for Table 4:

1. Parts are tested in pulsed conditions, T_c = 25˚C. Pulse width is 10ms.
2. Voltage minimum and maximum are provided for reference only and are not a guarantee of performance.
3. Bridgelux maintains a tester tolerance of ± 0.10V on forward voltage measurements.
4. Typical coefficient of forward voltage tolerance is ± 0.1mV for nominal current.
5. Thermal resistance values are based from test data of a 3000K 80 CRI product.
6. 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.

Absolute Maximum Ratings

Table 5: Maximum Ratings

Parameter	Maximum Rating
LED Junction Temperature (T_j)	150˚C
Storage Temperature	-40˚C to +100˚C
Operating Case Temperature[1] (T_c)	105˚C
Soldering Temperature[2]	350˚C or lower for a maximum of 3.5 seconds
Maximum Drive Current[3]	700 mA
Maximum Reverse Voltage[5]	-60 V

Notes for Table 5:

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 product warranty will be void.
4. 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.
5. Operating Case Temperature 105˚C is with drive current≤500mA. When drive current is Maximum drive current,Operating Case Temperature should be limited with ≤85˚C.

Performance Curves

Figure 1: HD3 Drive Current vs. Voltage ($T_j = T_c = 25^{\circ}C$)[1]

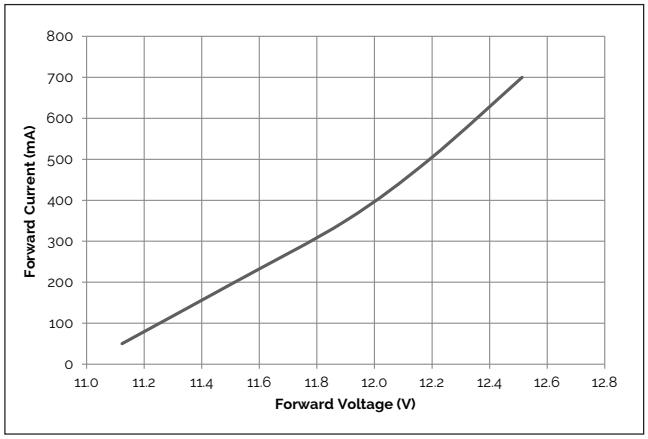


Figure 2: HD3 Typical Relative Luminous Flux vs. Drive Current ($T_j = T_c = 25^{\circ}C$)[1]

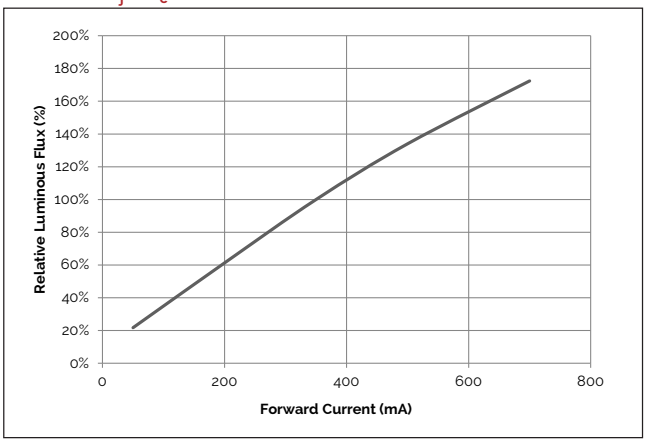


Figure 3: Typical DC Flux vs. Case Temperature

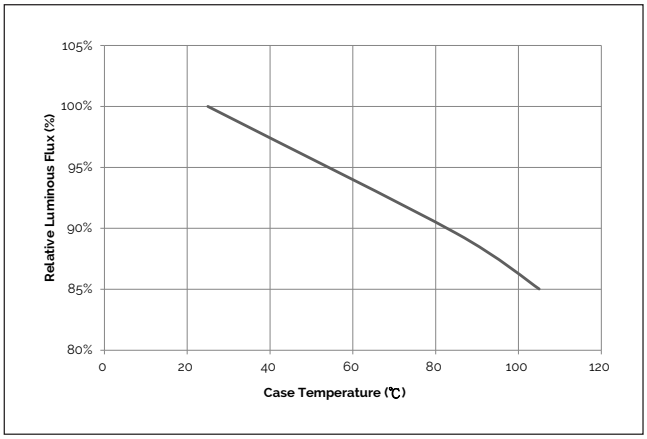


Figure 4: Typical DC ccx Shift vs. Case Temperature

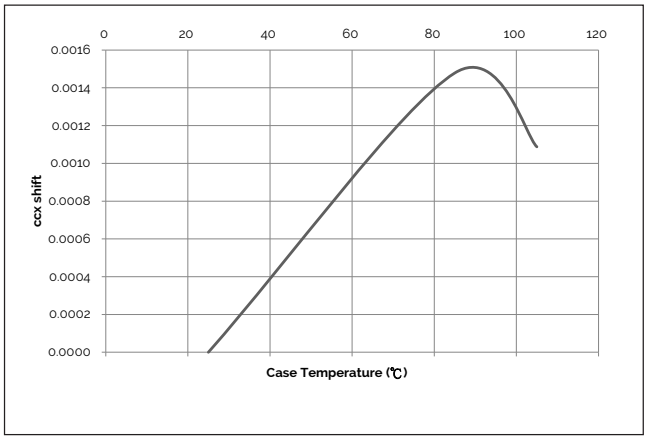
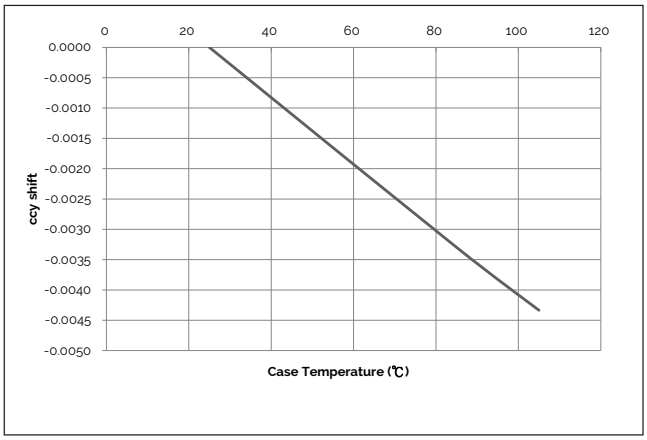


Figure 5: Typical DC ccy Shift vs. Case Temperature

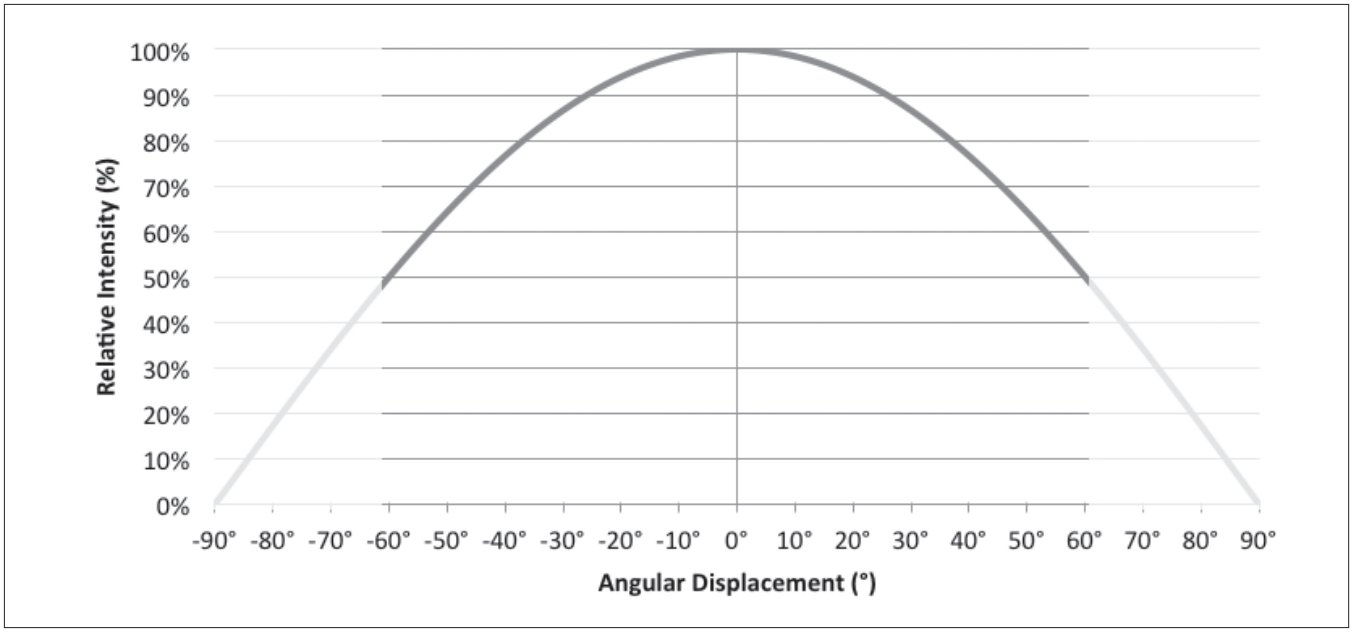


Notes for Figures 1 - 5:

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

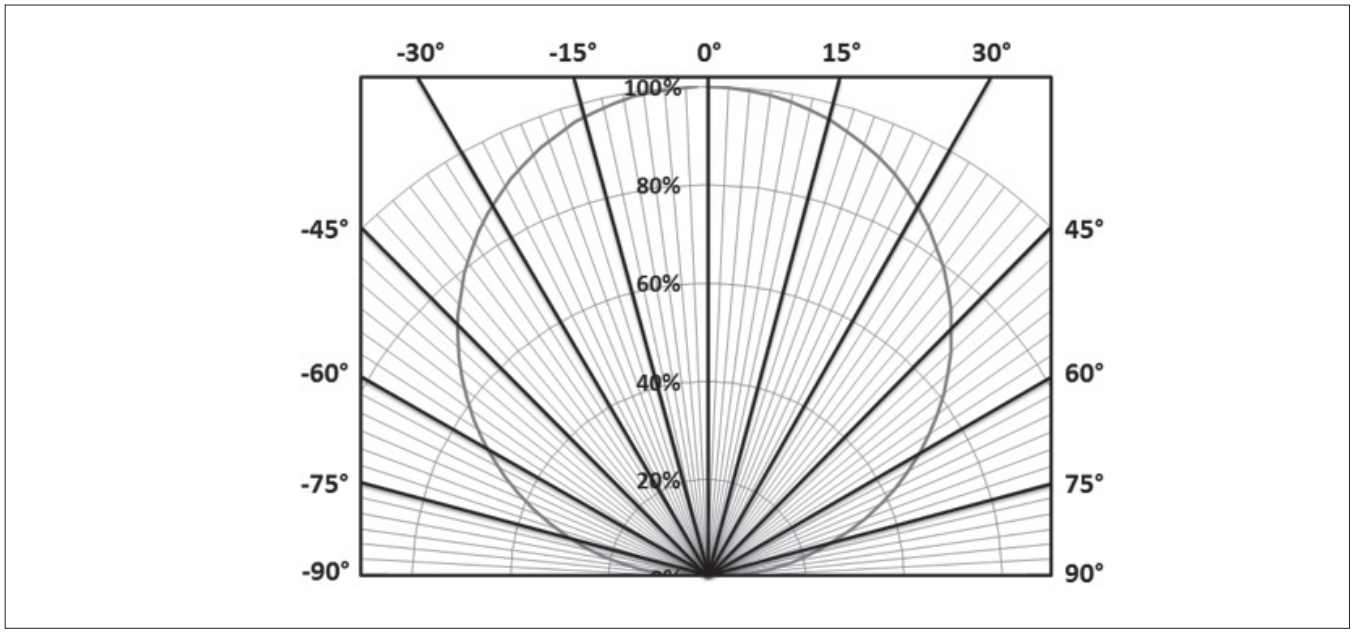
Figure 6: Typical Spatial Radiation Pattern



Notes for Figure 6:

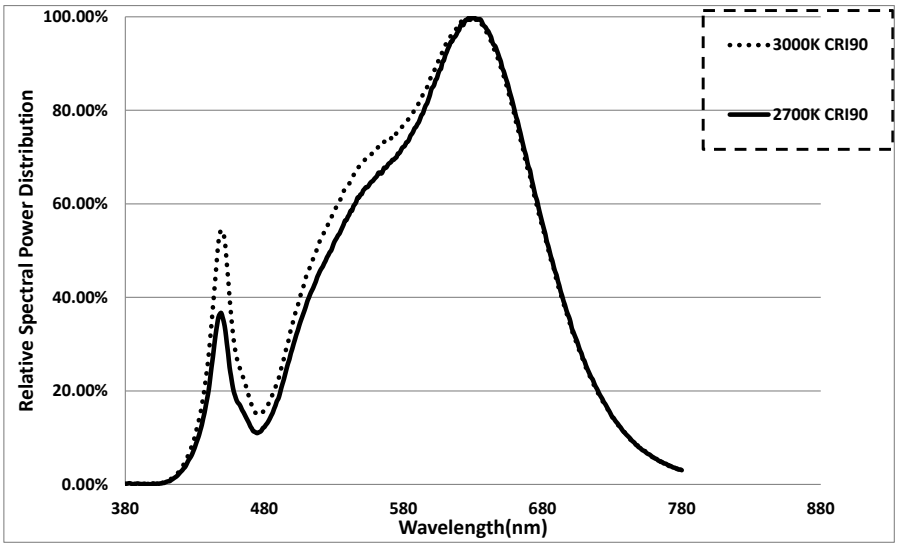
1. Typical viewing angle is 120°.
2. The viewing angle is defined as the off axis angle from the centerline where intensity is ½ of the peak value.

Figure 7: Typical Polar Radiation Pattern



Typical Color Spectrum

Figure 8: Typical Color Spectrum

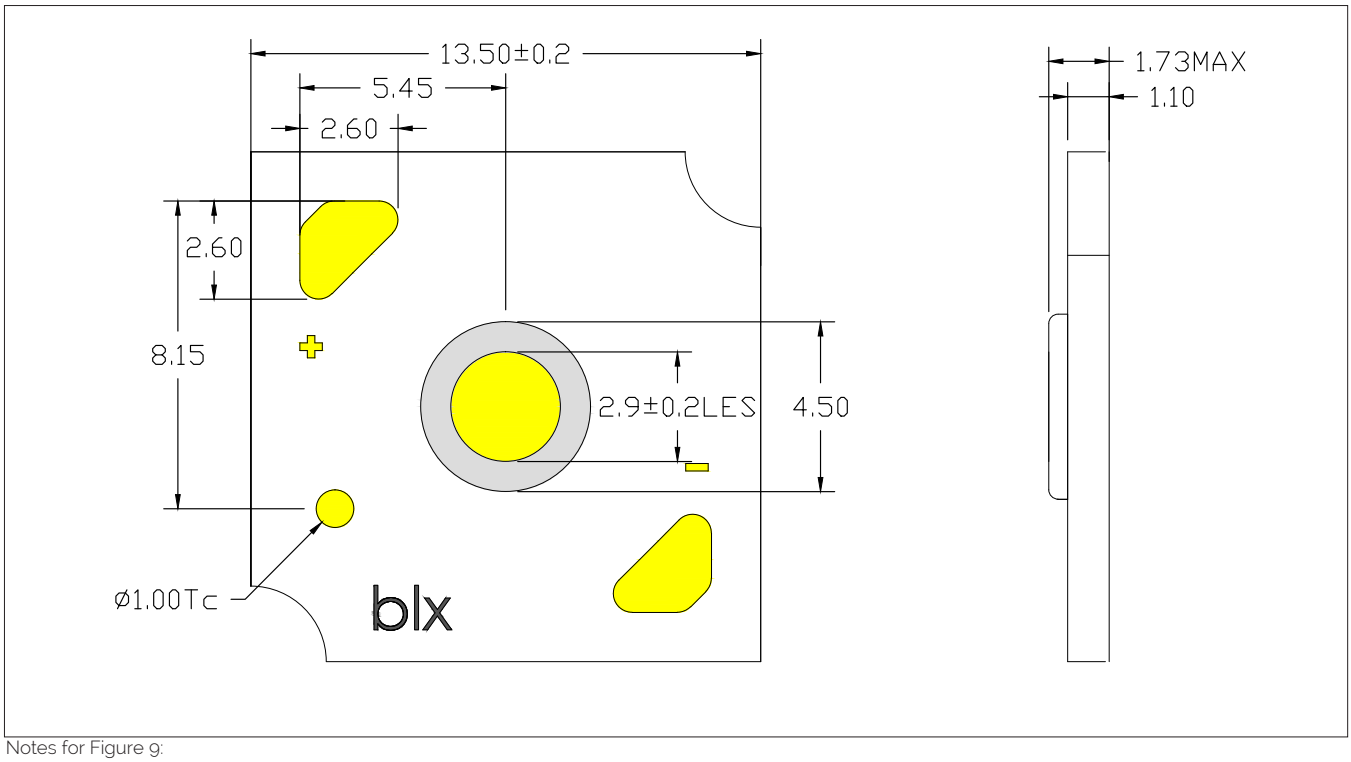


Notes for Figure 8:

1. Color spectra measured at nominal current for T_j = T_c = 25°C.
2. Color spectra shown is 2700K and 90 CRI.
3. Color spectra shown is 3000K and 90 CRI.

Mechanical Dimensions

Figure 9: Drawing for HD3 LED Array

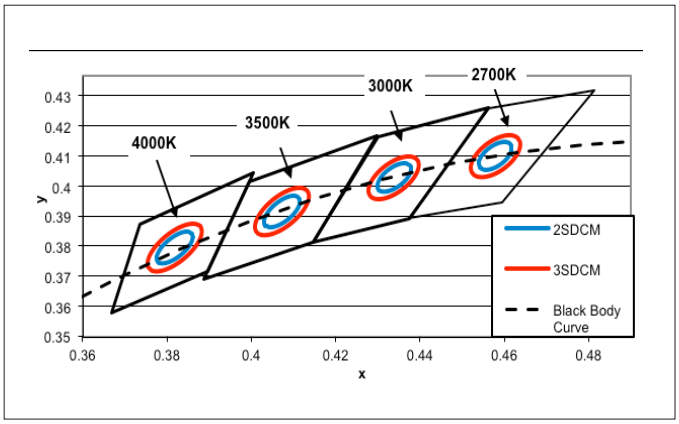


Notes for Figure 9:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are ±0.1mm.
4. Solder pad labeled "+" denotes positive contact.
5. Refer to Application Notes AN101 for product handling, mounting and heat sink recommendations.
6. The optical center of the LED Array is nominally defined by the mechanical center of the array to a tolerance of ± 0.2mm.
7. Bridgelux maintains a flatness of 0.10mm across the mounting surface of the array.

Color Binning Information

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



Note: Pulsed Test Conditions, T_c = 85°C

Table 6: Warm and Neutral White xy Bin Coordinates and Associated Typical CCT

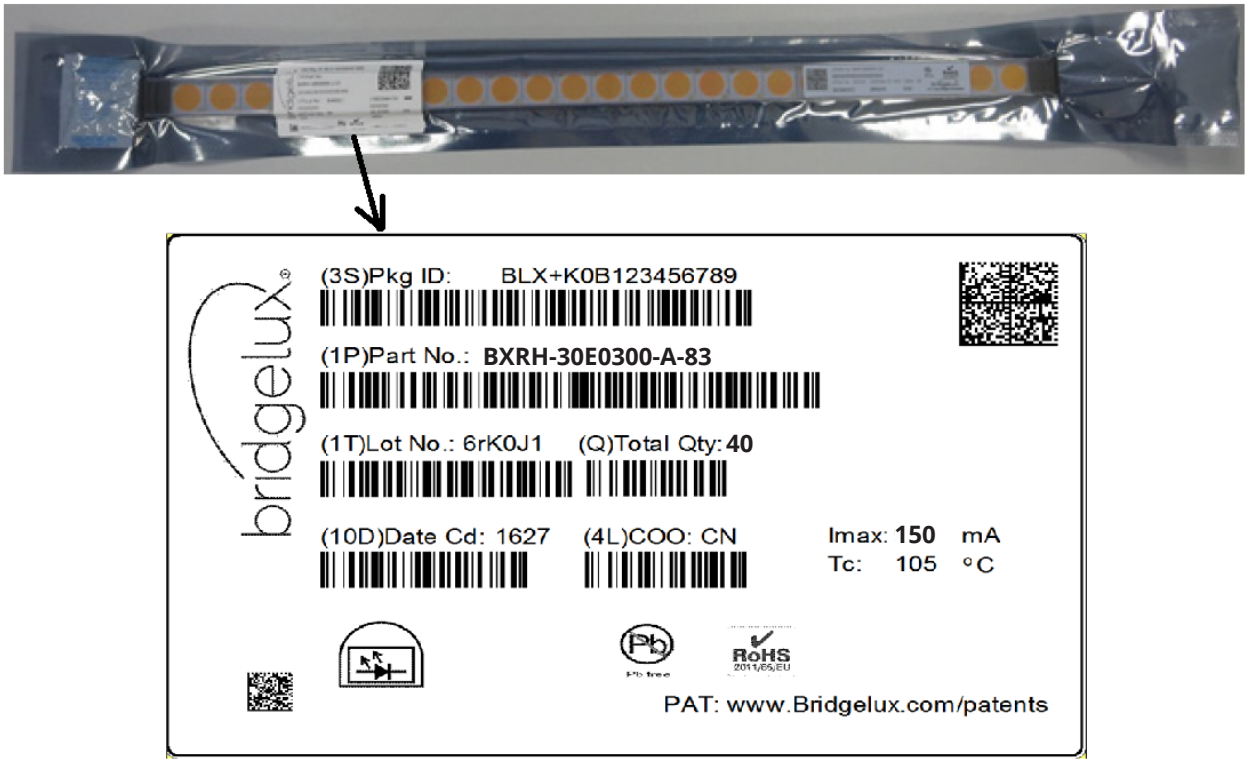
Bin Code	2700K	3000K	3500K	4000K
ANSI Bin (for reference only)	(2580K - 2870K)	(2870K - 3220K)	(3220K - 3710K)	(3710K - 4260K)
83 (3 SDCM)	(2651K - 2794K)	(2968K - 3136K)	(3369K - 3586K)	(3851K - 4130K)
82 (2 SDCM)	(2674K - 2769K)	(2995K - 3107K)	(3404K - 3548K)	(3895K - 4081K)
Center Point (x,y)	(0.4578,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

Note for Table 6:

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

Packaging and Labeling

Figure 11: V3 HD Packaging Tube



Notes for Figure 11:

1. Each tube holds 40 V3 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 14.3 (W) x 8.3(H) x 530 (L) mm. Dimensions for the anti-static bag are 75 (W) x 615 (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 12: 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 HD 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 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 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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