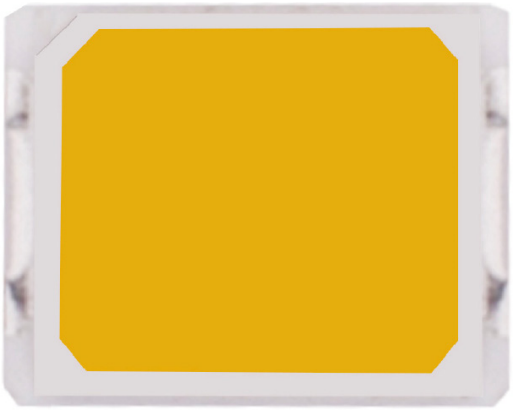


Bridgelux® SMD 2835 0.5W 3V Thrive™

Product Data Sheet DS312

BXEN-27S | 30S | 40S | 50S

Introduction

SMD 2835 Thrive

Bridgelux Thrive™ combines unique chip, phosphor and packaging technology to closely match the spectra of natural light over the visible wavelength range. Thrive can be used in constant color point luminaires to bring full spectrum natural light indoors or in tunable white luminaires to incorporate circadian elements that may impact human well-being. The high fidelity spectral output of Thrive creates stunning environments with excellent color rendering and outstanding TM30 metrics. Thrive is available in both SMD components and LED arrays to enable a broad range of lighting applications including retail, hospitality, office, education, architectural, museums, healthcare and residential lighting.

Features

- Engineered spectra to closely match natural light
- CRI > 95, R1-R15 >90, high Rf and Rg values
- High efficiency full spectrum solution
- No violet chip augmentation
- Hot color targeted
- Industry standard 2835 footprint
- Broad product platform availability (SMDs and COBs)

Benefits

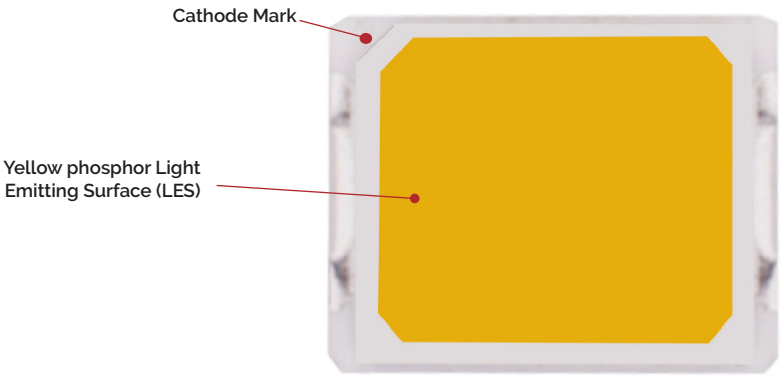
- Full consistent spectrum with fewer spectral spikes
- Natural and vivid color rendering
- Greater energy savings, lower utility costs
- Economical, high efficiency solution
- Uniform and consistent white light under application conditions
- Ease of design and rapid go-to-market
- Enables greater design flexibility and platform color consistency

Pb free RoHS

Contents

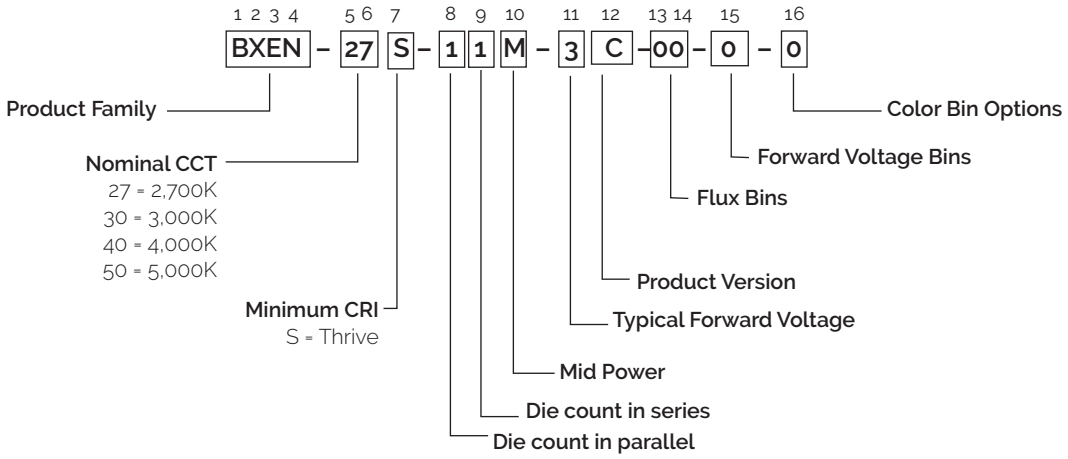
Product Feature Map

Bridgelux SMD LED products come in industry standard package sizes and follow ANSI binning standards. These LEDs are optimized for cost and performance, helping to ensure highly competitive system lumen per dollar performance while addressing the stringent efficacy and reliability standards required for modern lighting applications.



Product Nomenclature

The part number designation for Bridgelux SMD 2835 is explained as follows:



Product Test Conditions

Bridgelux SMD 2835 LEDs are tested and binned with a 10ms pulse of 150mA at T_j (junction temperature)=T_{sp} (solder point temperature) =25˚C. Forward voltage and luminous flux are binned at a T_j=T_{sp}=25˚C, while color is hot targeted at a T_{sp} of 85˚C.

Product Selection Guide

The following product configurations are available:

Table 1: Selection Guide, Pulsed Measurement Data at 150mA (T_j=T_{sp}=25°C)

Part Number[1,6]	Nominal CCT[2] (K)	CRI[3,5] (Typical)	Nominal Drive Current (mA)	Forward Voltage[4,5] (V)			Typical Pulsed Flux (lm)[4,5]			Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max	Min	Typical	Max		
BXEN-27S-11M-3C-00-0-0	2700	97	150	2.90	3.10	3.30	45.0	51.0	55.0	0.5	110
BXEN-30S-11M-3C-00-0-0	3000	97	150	2.90	3.10	3.30	45.0	55.0	60.0	0.5	120
BXEN-40S-11M-3C-00-0-0	4000	97	150	2.90	3.10	3.30	50.0	56.0	60.0	0.5	127
BXEN-50S-11M-3C-00-0-0	5000	97	150	2.90	3.10	3.30	55.0	60.0	65.0	0.5	127

Table 2: Selection Guide, Pulsed Test Performance at 150mA (T_{sp} = 85°C)[7,8]

Part Number[1,6]	Nominal CCT[2] (K)	CRI[3,5] (Typical)	Nominal Drive Current (mA)	Forward Voltage[5] (V)			Typical Pulsed Flux (lm)[5]			Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max	Min	Typical	Max		
BXEN-27S-11M-3C-00-0-0	2700	97	150	2.84	3.04	3.24	39.2	44.5	47.9	0.5	98
BXEN-30S-11M-3C-00-0-0	3000	97	150	2.84	3.04	3.24	39.2	47.9	52.3	0.5	107
BXEN-40S-11M-3C-00-0-0	4000	97	150	2.84	3.04	3.24	43.6	48.8	52.3	0.5	113
BXEN-50S-11M-3C-00-0-0	5000	97	150	2.84	3.04	3.24	47.9	52.3	56.6	0.5	113

Notes for Tables 1 & 2:

1. The last 6 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-0-0" denotes the full distribution of flux, forward voltage, and 6 SDCM color.
   Example: BXEN-27S-11M-3C-00-0-0 refers to the full distribution of flux, forward voltage, and color within a 2700K 6-step ANSI standard chromaticity region with a minimum of 97 CRI, 1x1 die configuration, mid power, 3.1V typical forward voltage.
2. Product CCT is hot targeted at T_{sp} = 85°C. Nominal CCT as defined by ANSI C78.377-2011.
3. Listed CRIs are minimum values and include test tolerance.
4. Products tested under pulsed condition (10ms pulse width) at nominal drive current where T_j=T_{sp}=25°C.
5. Bridgelux maintains a ±7.5% tolerance on luminous flux measurements, ±0.1V tolerance on forward voltage measurements, and ±2 tolerance on CRI measurements for the SMD 2835.
6. Refer to Table 6 and Table 7 for Bridgelux SMD 2835 Luminous Flux Binning and Forward Voltage Binning information.
7. Typical pulsed test performance values are provided as reference only and are not a guarantee of performance.
8. Typical performance is estimated based on operation under pulsed current with LED emitter mounted onto a heat sink with thermal interface material and the solder point 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.
9. Photosynthetic Photon Flux is measure of photon flux in the 400nm-700nm region.

Spectrum Characteristics

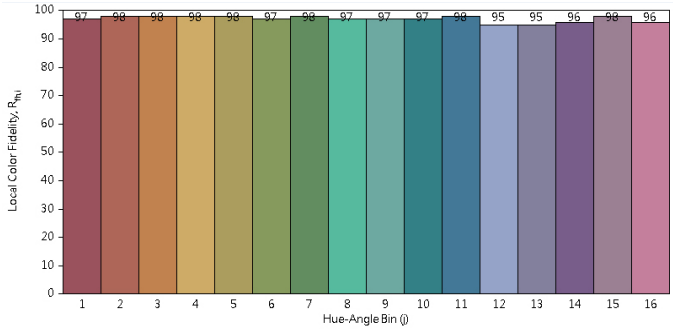
Table 3: Typical Color Rendering Index and TM-30 Values, 150mA, T_{sp}=85˚C [1]

Nominal CCT[1]	R_f	R_g	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
2700K	95	101	98	99	94	95	98	98	98	98	93	96	92	94	98	96	99
3000K	97	101	99	98	96	96	99	99	98	97	93	98	94	98	99	97	99
4000K	96	101	99	98	93	96	99	96	96	97	98	93	96	91	99	96	99
5000K	95	100	98	98	95	97	98	96	97	98	95	94	97	91	98	97	94

Note for Table 3:

1. Bridgelux maintains a tolerance of ± 3 on Color Rendering Index R1-R15 measurements and TM-30 measurements.
2. Rn reference by Nominal Drive Current will have deviations when changed drive current .

Figure 1: 2700K Thrive TM-30 Graphs



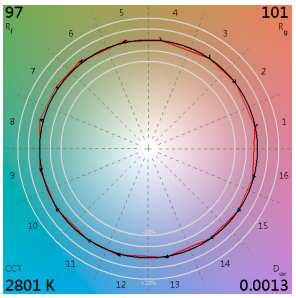
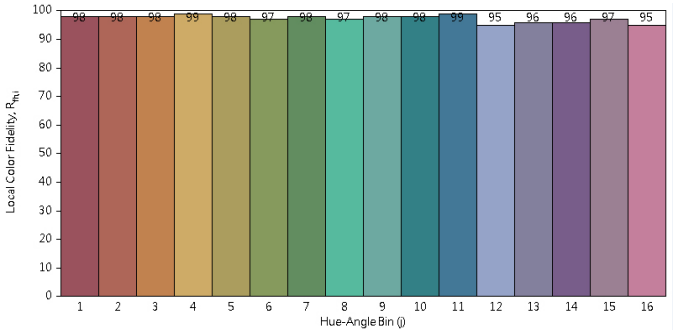
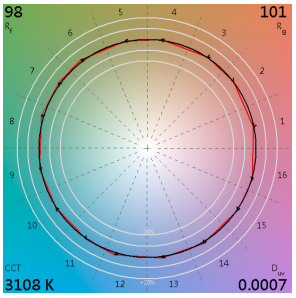


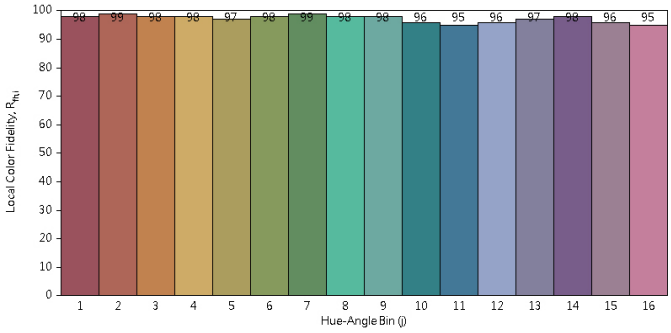
Figure 2: 3000K Thrive TM-30 Graphs





Spectrum Characteristics

Figure 3: 4000K Thrive TM-30 Graphs



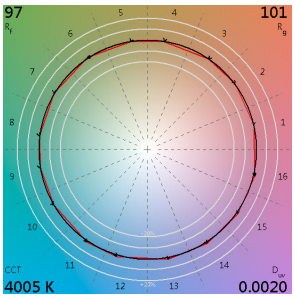
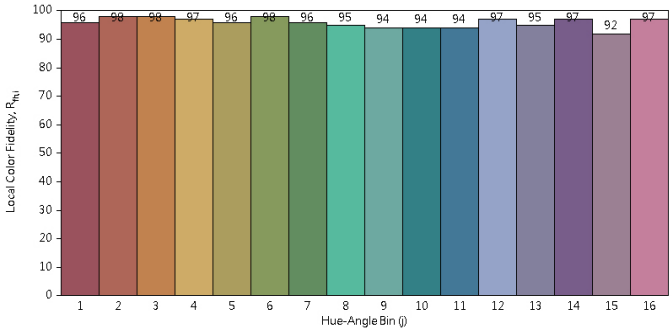
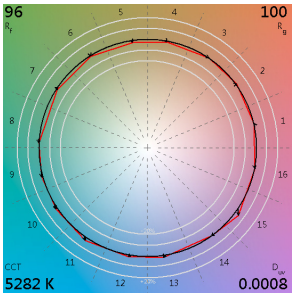


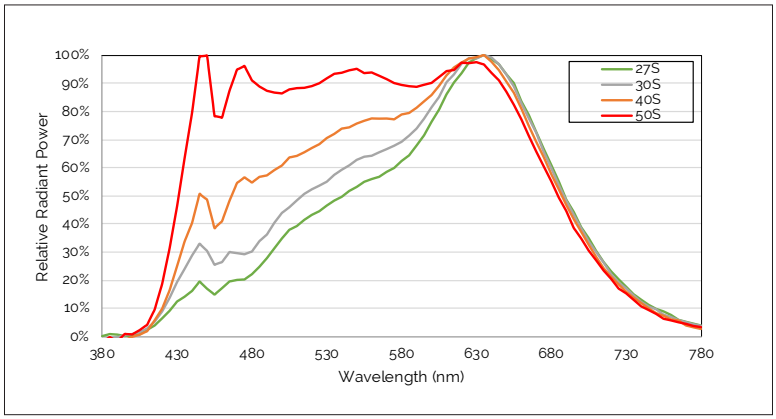
Figure 4: 5000K Thrive TM-30 Graphs





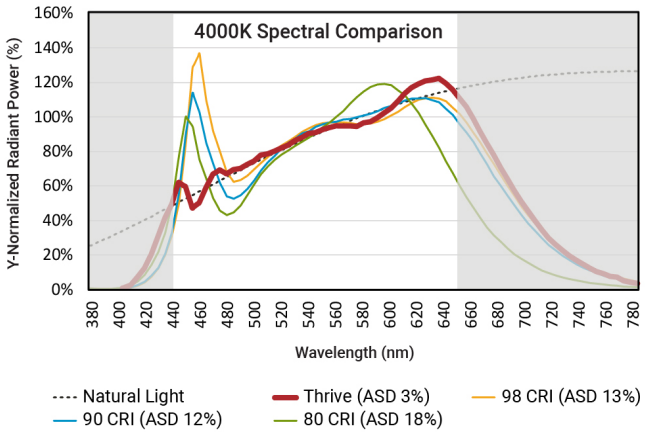
Spectrum Characteristics

Figure 5: Typical Color Spectrum



Note for Figure 5:

1. Color spectra measured at nominal current for T_{sp} = 85°C.



Spectral Matching to Natural Light

Humans have evolved and thrived for millions of years under the sun's natural daylight. While discussions continue regarding the development of LED products with artificial spectra aimed at increasing productivity and focus or helping with relaxation, the long-term physiological effects of such altered environments on humans remains unknown.

Bridgelux Thrive is engineered to provide the closest match to natural light using proprietary chip, phosphor and packaging technology. Bridgelux is working with our customers and industry partners to define new metrics to describe and quantify this spectral matching; going beyond today's quality of light metrics such as CRI and TM-30.

To quantify spectral matching, Bridgelux has defined a new term; Average Spectral Difference (ASD). ASD is calculated by measuring the absolute difference between the LED spectrum and a natural light source spectrum at discrete wavelengths. These values are then averaged across different wavelength ranges and reported as a percentage. Natural light is defined by the Black Body Curve for sources below 5000K or by the CIE Standard Illuminant D for sources of 5000K or above (D50 for example).

Bridgelux Thrive has an ASD between 3% and 7% for all color points (2700K – 6500K) across the typical LED wavelength range of 440-650nm. This includes a very close spectral match, with an ASD of only 2% for some color point options, in the blue/cyan color range where most other LED light sources suffer. For comparison purposes, standard 80, 90 and 98 CRI light sources have an ASD that is 2-6 times larger than Thrive over the same wavelength range and up to 20 times greater in the cyan wavelength range.

As the industry evolves toward human centric lighting, Bridgelux will work with our customers and industry experts to educate the market about the benefits of the ASD metric to further quantify the quality of light.

Electrical Characteristics

Table 4: Electrical Characteristics

Part Number [1]	Drive Current (mA)	Forward Voltage (V) [2,3]			Typical Temperature Coefficient of Forward Voltage $\Delta V_f/\Delta T$ (mV/°C)	Typical Thermal Resistance Junction to Solder Point[4] $R_{j\text{-}sp}$ (°C/W)
		Minimum	Typical	Maximum		
BXEN-XXX-11M-3C-00-0-0	150	2.9	3.1	3.3	-1.04	31

Notes for Table 4:

1. The last 6 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-0-00" denotes the full distribution of flux, forward voltage, and 6 SDCM color.
   Example: BXEN-27S-11M-3C-00-0-0 refers to the full distribution of flux, forward voltage, and color within a 2700K 6-step ANSI standard chromaticity region with a minimum of 97 CRI, 1x1 die configuration, mid power, 3.1V typical forward voltage.
2. Bridgelux maintains a tolerance of ± 0.1V on forward voltage measurements. Voltage minimum and maximum values at the nominal drive current are guaranteed by 100% test.
3. Products tested under pulsed condition (10ms pulse width) at nominal drive current where Tsp = 25°C.
4. Thermal resistance value was calculated using total electrical input power; optical power was not subtracted from input power.

Absolute Maximum Ratings

Table 5: Maximum Ratings

Parameter	Maximum Rating
LED Junction Temperature (T_j)	125˚C
Storage Temperature	-40˚C to +105˚C
Operating Solder Point Temperature (T_{sp})	-40˚C to +105˚C
Soldering Temperature	260˚C or lower for a maximum of 10 seconds
Maximum Drive Current	150mA
Maximum Peak Pulsed Forward Current[1]	300mA
Maximum Reverse Voltage[2]	-
Moisture Sensitivity Rating	MSL 3
Electrostatic Discharge	2kV HBM. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Notes for Table 5:

1. Bridgelux recommends a maximum duty cycle of 10% and pulse width of 10 ms when operating LED SMD at maximum peak pulsed current specified. Maximum peak pulsed current indicate values where LED SMD can be driven without catastrophic failures.
2. Light emitting diodes are not designed to be driven in reverse voltage and will not produce light under this condition. no rating is provided.

Product Bin Definitions

Table 6 lists the standard photometric luminous flux bins for Bridgelux SMD 2835 LEDs. Although several bins are listed, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

Table 6: Luminous Flux Bin Definitions at 150mA, T_{sp}=25˚C

Bin Code	Minimum	Maximum	Unit	Condition
29	45	50	lm	I_F=150mA
2A	50	55		
2B	55	60		
2C	60	65		

Note for Table 6:

1. Bridgelux maintains a tolerance of ± 7.5% on luminous flux measurements

Table 7: Forward Voltage Bin Definition at 150mA, T_{sp}=25˚C

Bin Code	Minimum	Maximum	Unit	Condition
A	2.8	2.9	V	I_F=150mA
B	2.9	3.0		
C	3.0	3.1		
D	3.1	3.2		
E	3.2	3.3		

Note for Table 7:

1. Bridgelux maintains a tolerance of ± 0.1V on forward voltage measurements.

Product Bin Definitions

Table 8: MacAdam Ellipse Color Bin Definitions

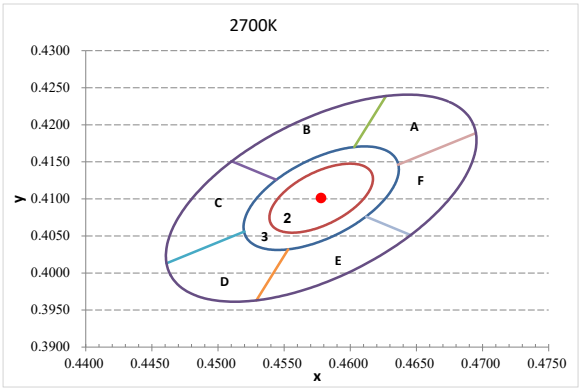
CCT	Color Space	Center Point		Major Axis	Minor Axis	Ellipse Rotation Angle	Color Bin
		X	Y				
2700K	2 SDCM	0.4578	0.4101	0.0054	0.0028	53.70	2
	3 SDCM	0.4578	0.4101	0.0081	0.0042	53.70	2/3
	6 SDCM	0.4578	0.4101	0.0162	0.0084	53.70	2/3/A/B/C/D/E/F
3000K	2 SDCM	0.4338	0.4030	0.00556	0.00272	53.22	2
	3 SDCM	0.4338	0.4030	0.00834	0.00408	53.22	2/3
	6 SDCM	0.4338	0.4030	0.01668	0.00816	53.22	2/3/A/B/C/D/E/F
4000K	2 SDCM	0.3818	0.3797	0.00626	0.00268	53.72	2
	3 SDCM	0.3818	0.3797	0.00939	0.00402	53.72	2/3
	6 SDCM	0.3818	0.3797	0.01878	0.00804	53.72	2/3/A/B/C/D/E/F
5000K	3 SDCM	0.3447	0.3553	0.00822	0.00354	59.62	3
	6 SDCM	0.3447	0.3553	0.01644	0.00708	59.62	3/A/B/C/D/E/F

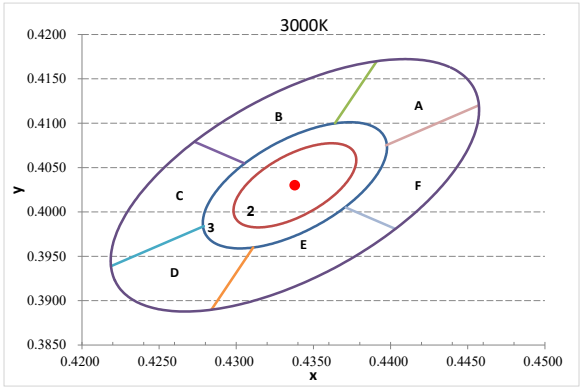
Notes for Table 8:

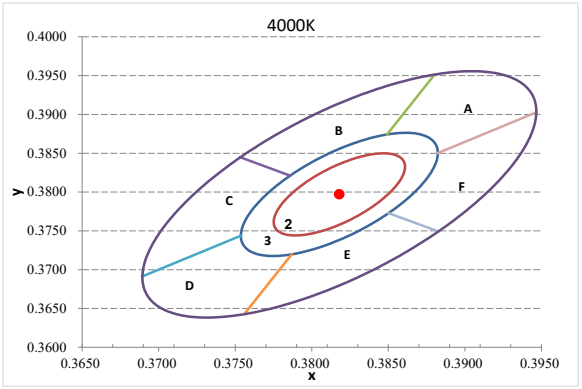
1. Color binning at T_{sp}=85˚C unless otherwise specified
2. Bridgelux maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

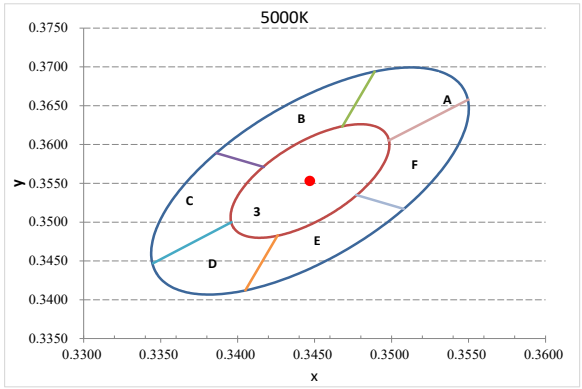
Product Bin Definitions

Figure 6: C.I.E. 1931 Chromaticity Diagram (Color Targeted at T_{sp}=85°C)









Kitting bins matching	
BIN#1	**BIN#2**
2	2
3	3
A	D
B	E
C	F

Performance Curves

Figure 7: Drive Current vs. Voltage (T_{sp}=25°C)

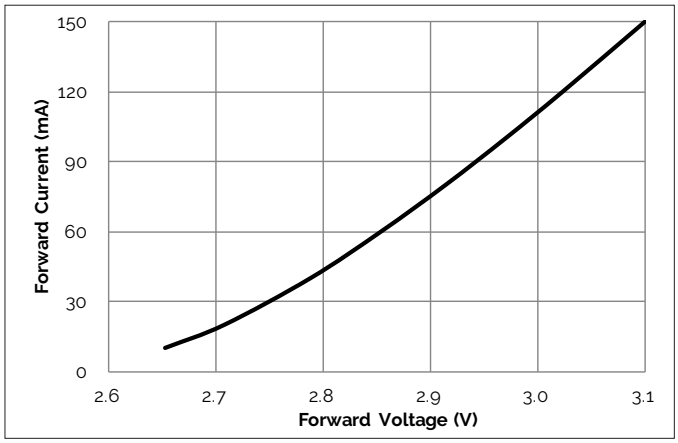


Figure 8: Typical Relative Luminous Flux vs. Drive Current (T_{sp}=25°C)[1]

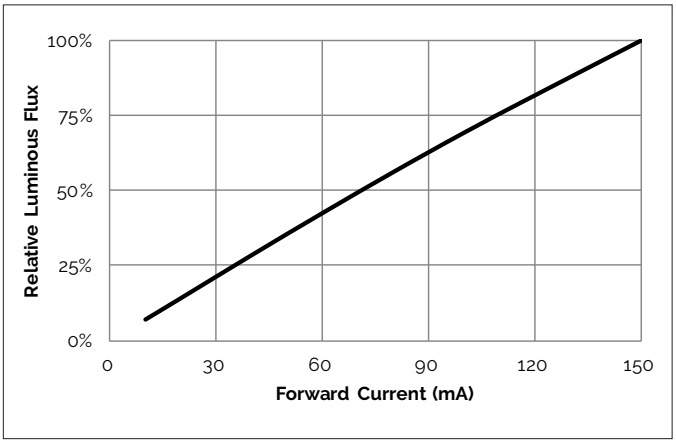


Figure 9: Typical Relative Flux vs. Solder Point Temperature[2,3,4,5]

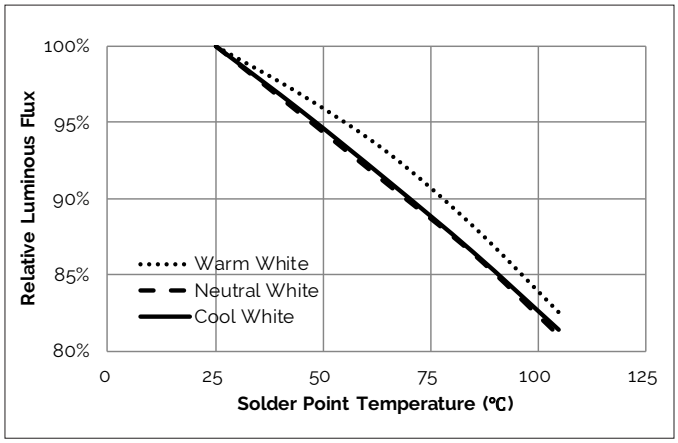


Figure 10: Typical ccx Shift vs. Solder Point Temperature[2,3,4,5]

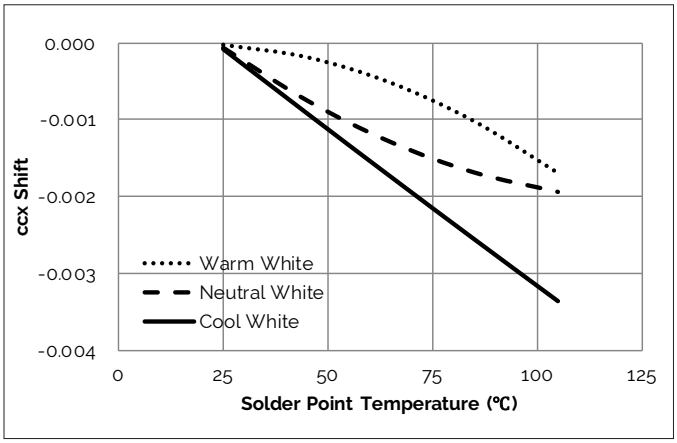
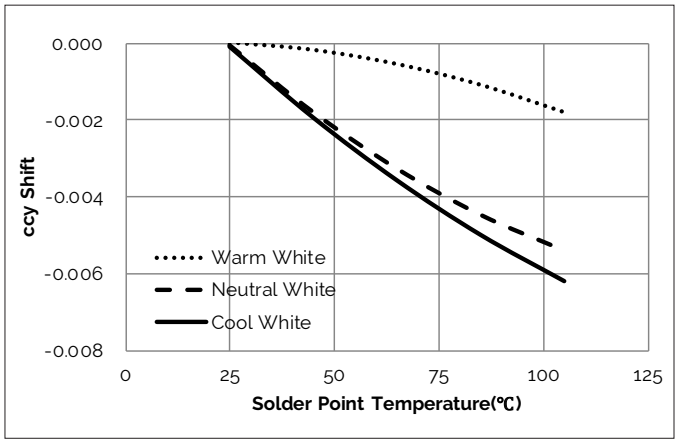


Figure 11: Typical ccy Shift vs. Solder Point Temperature[2,3,4,5]

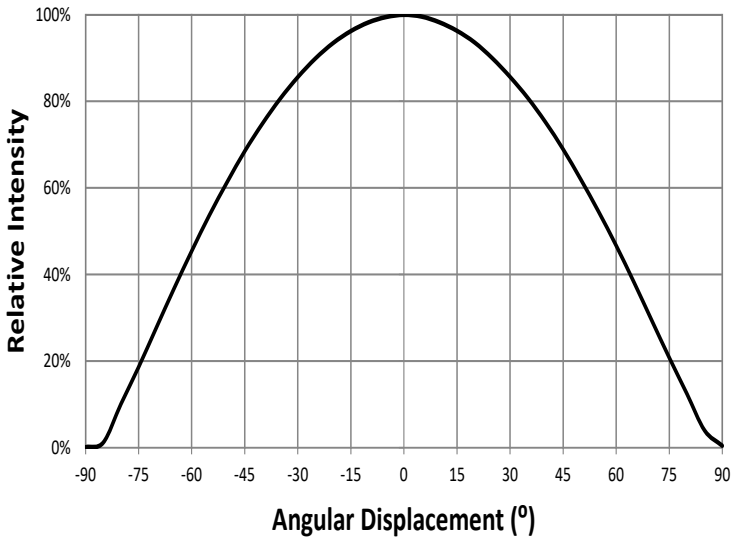


Note for Figures 7-11:

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 warm white based on 2700K.
3. Characteristics shown for neutral white based on 4000K.
4. Characteristics shown for cool white based on 5000K.
5. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information .

Typical Radiation Pattern

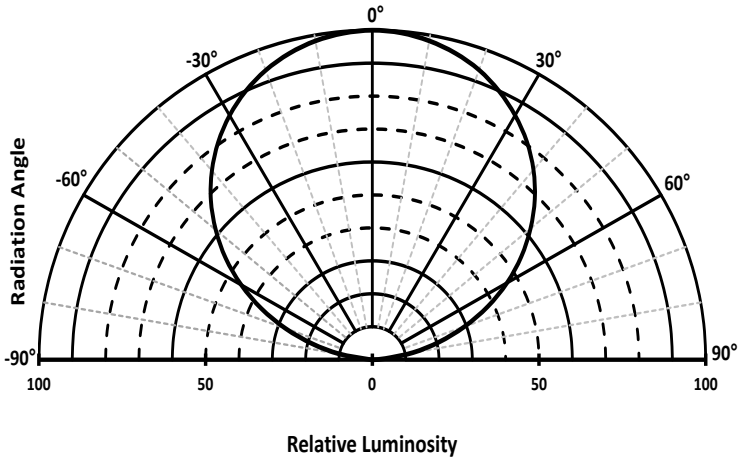
Figure 12: Typical Spatial Radiation Pattern at 150mA, T_{sp}=25°C



Notes for Figure 12:

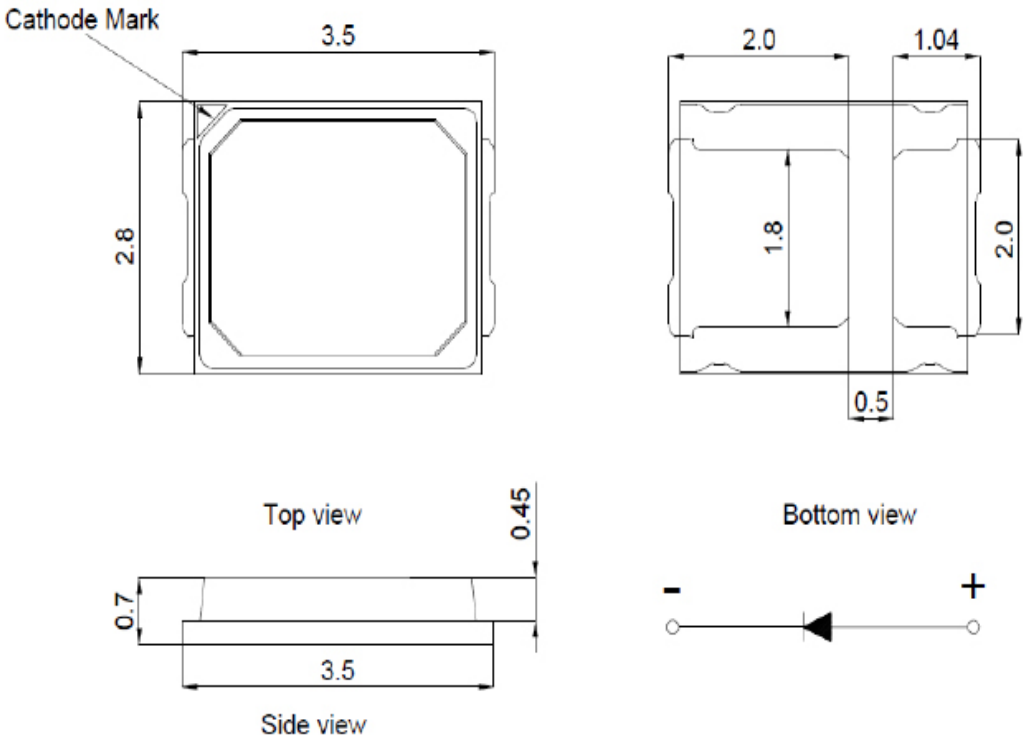
1. Typical viewing angle is 116°.
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (Iv) is ½ of the peak value.

Figure 13: Typical Polar Radiation Pattern at 150mA, T_{sp}=25°C



Mechanical Dimensions

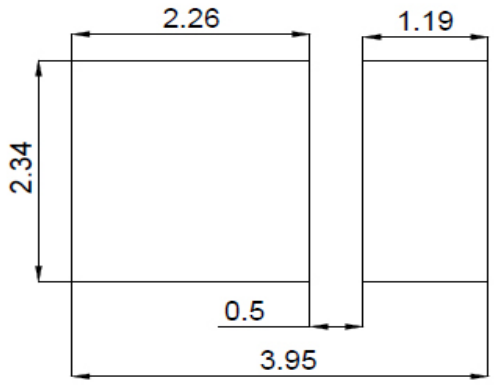
Figure 14: Drawing for SMD 2835



Notes for Figure 14:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are ± 0.10mm.

Recommended PCB Soldering Pad Pattern



Reliability

Table 9: Reliability Test Items and Conditions

No .	Items	Reference Standard	Test Conditions	Drive Current	Test Duration	Units Failed/Tested
1	Moisture/Reflow Sensitivity	J-STD-020E	T_{sld} = 260°C, 10sec, Precondition: 60°C, 60%RH, 168hr	-	3 reflows	0/22
2	Low Temperature Storage	JESD22-A119	T_a=-40°C	-	1000 hours	0/22
3	High Temperature Storage	JESD22-A103D	T_a= 105°C	-	1000 hours	0/22
4	Low Temperature Operating Life	JESD22-A108D	T_a=-40°C	150mA	1000 hours	0/22
5	Temperature Humidity Operating Life	JESD22-A101C	T_{sp}=85°C, RH=85%	150mA	1000 hours	0/22
6	High Temperature Operating Life	JESD22-A108D	T_{sp}=105°C	150mA	1000 hours	0/22
7	Power switching	IEC62717:2014	T_{sp}= 105°C 30 sec on, 30 sec off	150mA	30000 cycles	0/22
8	Thermal Shock	JESD22-A106B	T_a=-40°C ~100°C; Dwell : 15min; Transfer: 10sec	-	200 cycles	0/22
9	Temperature Cycle	JESD22-A104E	T_a=-40°C ~100°C; Dwell at extreme temperature: 15min; Ramp rate < 105°C/min	-	200 cycles	0/22
10	Electrostatic Discharge	JS-001-2012	HBM, 2KV, 1.5kΩ, 100pF, Alternately positive or negative	-	-	0/22

Passing Criteria

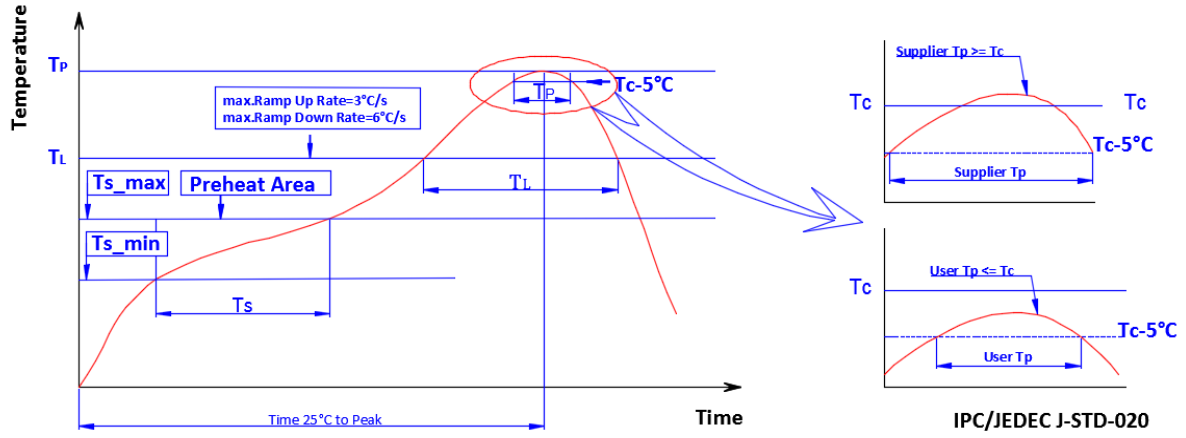
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	150mA	ΔVf<10%
Luminous Flux	Fv	150mA	ΔFv<30%
Chromaticity Coordinates	(x, y)	150mA	Δu'v'<0.007

Notes for Table 9:

1. Measurements are performed after allowing the LEDs to return to room temperature
2. T_{sld} : reflow soldering temperature; T_a : ambient temperature

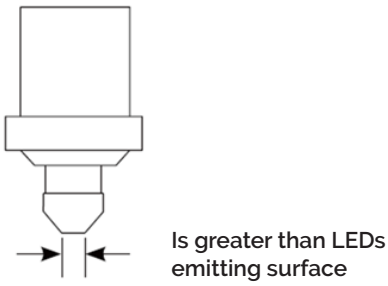
Reflow Characteristics

Figure 15 : Reflow Profile



Profile Feature	Lead Free Assembly
Temperature Min. (Ts_min)	160˚C
Temperature Max. (Ts_max)	205˚C
Time (ts) from Ts_min to Ts_max	60-150 seconds
Ramp-Up Rate (TL to Tp)	3 ˚C/second
Liquidus Temperature (TL)	220 ˚C
Time (TL) Maintained Above TL	60-150 seconds
Peak Temp(Tp)	260 ˚C max.
Time (Tp) Within 5 ˚C of the Specified Classification Temperature (Tc)	25 seconds max.
Ramp-Down Rate (Tp to TL)	5 ˚C/second max.
Time 25 ˚C to Peak Temperature	10 minutes max.

Figure 16 : Pick and Place

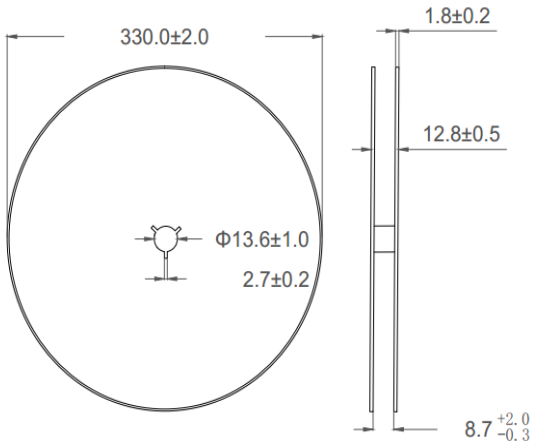


Note for Figure 16:

1. When using a pick and place machine, choose a nozzle that has a larger diameter than the LED's emitting surface. Using a Pick-and-Place nozzle with a smaller diameter than the size of the LEDs emitting surface will cause damage and may also cause the LED to not illuminate.

Packaging

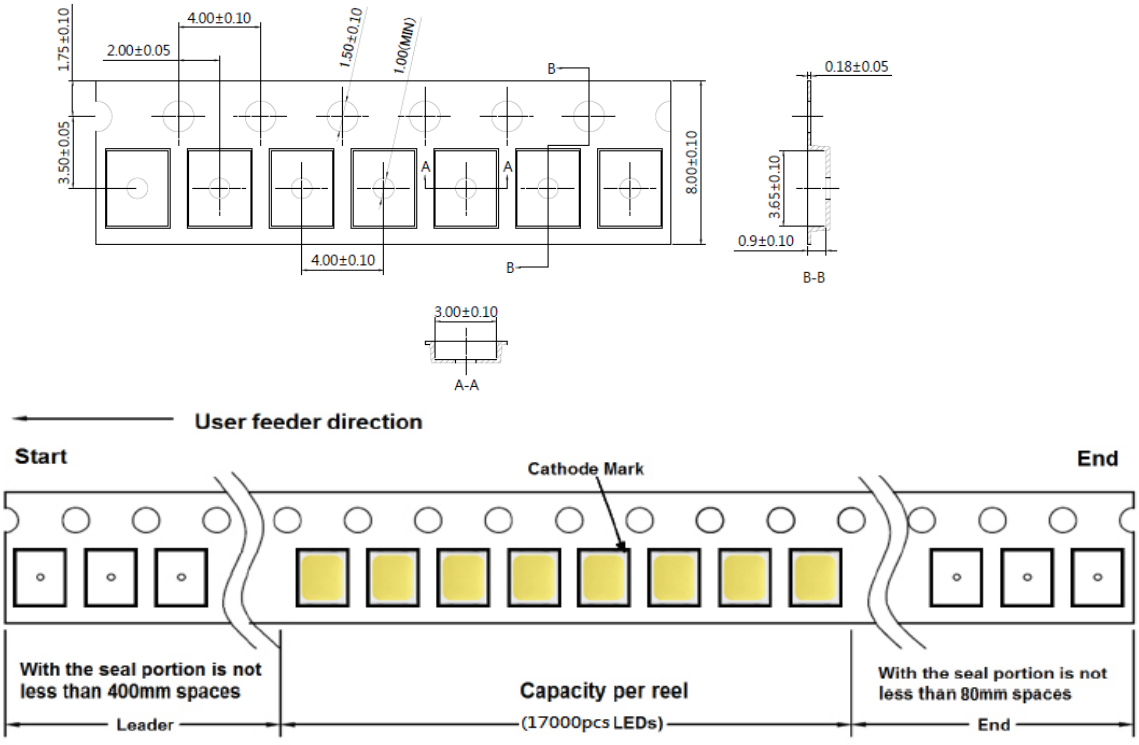
Figure 17: Emitter Reel Drawings



Note for Figure 17:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Figure 18: Emitter Tape Drawings

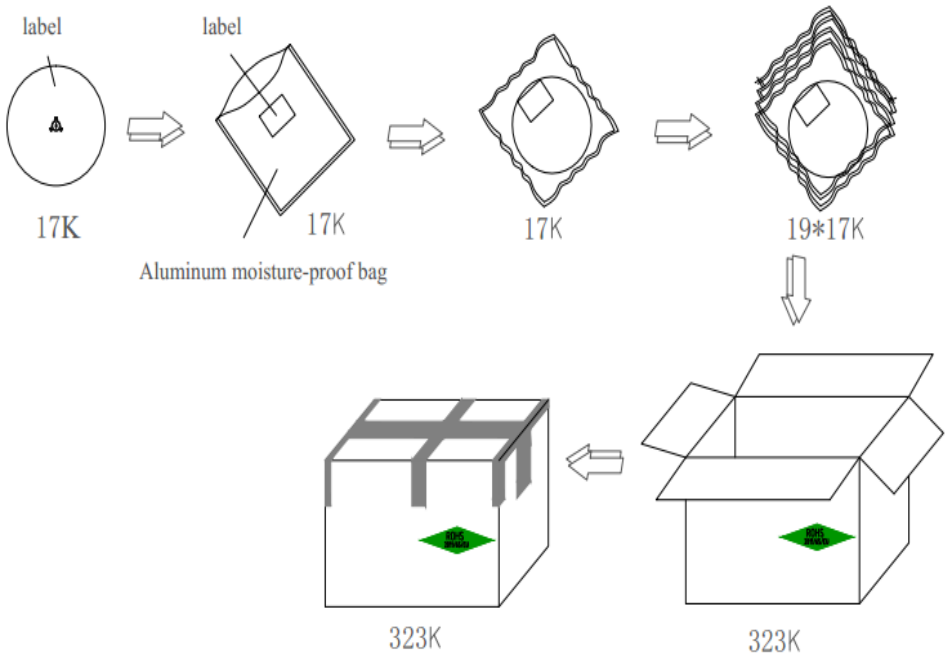


Note for Figure 18:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Packaging

Figure 19: SMD 2835 Packaging and Labeling



Note for Figure 19:

1. Drawings are not to scale.

Design Resources

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 emitter. Please consult Bridgelux Application Note AN51 for additional information.

CAUTION: EYE SAFETY

Eye safety classification for the use of Bridgelux SMD LED emitter is in accordance with IEC specification EN62778: Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires are classified as Risk Group 1 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 SMD LED emitter during operation. Allow the emitter to cool for a sufficient period of time before handling. The SMD LED emitter 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 emitter or apply stress to the LES (yellow phosphor resin area). Contact may cause damage to the emitter

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, LED emitter 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
bridgelux.com
twitter.com/Bridgelux
facebook.com/Bridgelux
linkedin.com/company/bridgelux-inc-_2
youtube.com/user/Bridgelux
WeChat ID: BridgeluxInChina

46430 Fremont Boulevard
Fremont, CA 94538 USA
Tel (925) 583-8400
www.bridgelux.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for High Power LEDs - White ***category:***

Click to view products by Bridgelux ***manufacturer:***

Other Similar products are found below :

G42180-08 B42180-08 STW8Q2PA-R5-HA SZ5-M1-W0-00-V3/W2-AA LTPL-P00DWS57 LZP-D0WW00-0000 CLM-9-30-90-36-AC32-F4-3 SZ5-M1-WW-C8-V1/V3-FA BXRC-27E2000-D-73 BXRC-27G2000-D-73 BXRC-30E1000-D-73 BXRC-30G2000-D-73 BXRC-40E1000-D-73 BXRE-30G2000-B-73 BXRE-30G2000-C-73 BXRE-50C2001-C-74 CXM-22-27-80-54-AC30-F4-3 XHP50B-00-0000-0D0UH245G XHP50B-00-0000-0D0UH240G XHP50B-00-0000-0D0UG227H XHP50B-00-0000-0D0HJ245G MP-5050-8100-27-80 MP-5050-6100-65-80 MP-5050-6100-50-80 MP-5050-6100-40-80 MP-5050-6100-30-80 CXM-22-30-80-54-AC30-F4-3 LTW-2835SZK57 BXEM-50C0000-0-000 WW-WNA30TS-U1(M1) KW CSLPM2.CC-8L8M-4L8N KW CSLPM2.CC-8L8M-4O9Q KW DPLS32.SB-6H6J-E5P7-EG-Z264 L1V1-507003V500000 CXM-22-35-80-36-AC10-F3-3 KW3 CGLNM1.TG-Z6QF6-EBVFFCBB46-DFGA JB5630AWT-H-H65EA0000-NZ000001 XHP50B-00-0000-0D0UG430H CXM-22-35-90-54-AC40-F5-3 CXM-22-35-80-54-AC40-F5-3 OSM51206E1N-0.8T OSW43020C1C MP161611032290 MP-1616-2103-50-90 KW CULPM1.TG-Z6RF7-ebvFfcbB46-65G5 KW DMLS33.SG-Z6M7-EBVFFCBB46-8E8G-700-S XPGDWT-B1-0000-00EEA XHP70B-00-0000-0D0BP450E KW DMLN33.SG-7J7K-EBVFFCBB46-8E8G-200-S ASMT-MW05-NMNS1