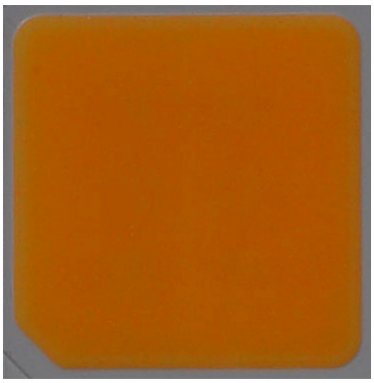


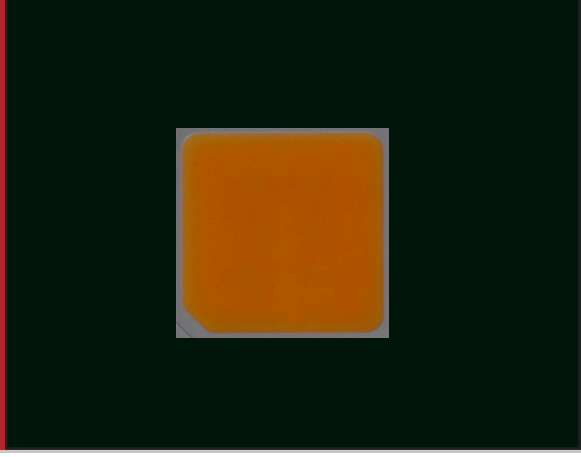
Bridgelux® SMD 5050 1W 24V

Product Data Sheet DS73

BXEP-27X | 30X | 35X | 40X | 45X | 50X | 57X | 65X

Introduction

SMD 5050



The Bridgelux SMD 5050 high power LED is hot-color targeted, which ensures that the LEDs fall within their specified color bin at the typical application conditions of 85˚C. With its broad lumen coverage and wide range of CCT options, the SMD 5050 provides unparalleled design-in flexibility for indoor and outdoor lighting applications. The SMD 5050 is ideal as a drop-in replacement for emitters with an industry standard 5.0mm x 5.0mm footprint.

Features

- Industry-standard 5050 footprint
- 3 bin color control enables tight color control
- Hot-color targeting ensures that color is within the ANSI bin at the typical application conditions of 85˚C
- Enables 3- and 5-step MacAdam ellipse custom binning kits
- RoHS compliant and lead free
- Multiple CCT configurations for a wide range of lighting applications

Benefits

- Lower operating and manufacturing cost
- Ease of design and rapid go-to-market
- Uniform consistent white light
- Reliable and constant white point
- Environmentally friendly, complies with standards
- Design flexibility

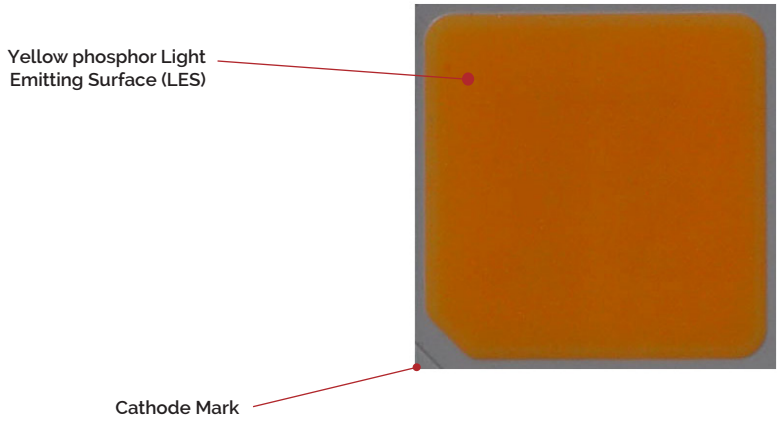
Pb free

RoHS

Contents

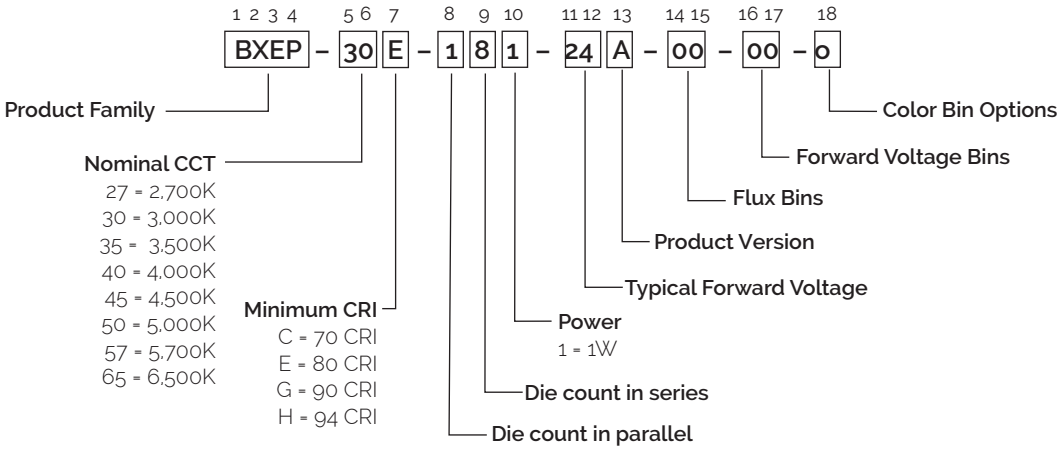
Product Feature Map

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 5050 is explained as follows:



Product Test Conditions

Bridgelux SMD 5050 LEDs are tested and binned with a 10ms pulse of 45mA 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 45mA (T_j=T_{sp}=25˚C)

Part Number[1,6]	Nominal CCT[2] (K)	CRI[3,5]	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			
BXEP-27C-181-24A-00-00-0	2700	70	45	20.8	22.0	24.6	183	1.0	185
BXEP-27E-181-24A-00-00-0	2700	80	45	20.8	22.0	24.6	163	1.0	165
BXEP-27G-181-24A-00-00-0	2700	90	45	20.8	22.0	24.6	140	1.0	141
BXEP-27H-181-24A-00-00-0	2700	94	45	20.8	22.0	24.6	135	1.0	136
BXEP-30C-181-24A-00-00-0	3000	70	45	20.8	22.0	24.6	187	1.0	189
BXEP-30E-181-24A-00-00-0	3000	80	45	20.8	22.0	24.6	170	1.0	172
BXEP-30G-181-24A-00-00-0	3000	90	45	20.8	22.0	24.6	143	1.0	144
BXEP-35C-181-24A-00-00-0	3500	70	45	20.8	22.0	24.6	190	1.0	192
BXEP-35E-181-24A-00-00-0	3500	80	45	20.8	22.0	24.6	175	1.0	177
BXEP-40C-181-24A-00-00-0	4000	70	45	20.8	22.0	24.6	192	1.0	194
BXEP-40E-181-24A-00-00-0	4000	80	45	20.8	22.0	24.6	179	1.0	181
BXEP-40G-181-24A-00-00-0	4000	90	45	20.8	22.0	24.6	154	1.0	156
BXEP-40H-181-24A-00-00-0	4000	94	45	20.8	22.0	24.6	148	1.0	150
BXEP-45C-181-24A-00-00-0	4500	70	45	20.8	22.0	24.6	192	1.0	194
BXEP-45E-181-24A-00-00-0	4500	80	45	20.8	22.0	24.6	179	1.0	181
BXEP-50C-181-24A-00-00-0	5000	70	45	20.8	22.0	24.6	192	1.0	194
BXEP-50E-181-24A-00-00-0	5000	80	45	20.8	22.0	24.6	179	1.0	181
BXEP-57C-181-24A-00-00-0	5700	70	45	20.8	22.0	24.6	192	1.0	194
BXEP-57E-181-24A-00-00-0	5700	80	45	20.8	22.0	24.6	177	1.0	179
BXEP-65C-181-24A-00-00-0	6500	70	45	20.8	22.0	24.6	190	1.0	192
BXEP-65E-181-24A-00-00-0	6500	80	45	20.8	22.0	24.6	176	1.0	178

Notes for Table 1:

1. The last 7 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-00-0" denotes the full distribution of flux, forward voltage, and 7 SDCM color.

   Example: BXEP-30E-181-24A-00-00-0 refers to the full distribution of flux, forward voltage, and color within a 3000K 7-step ANSI standard chromaticity region with a minimum of 80CRI, 1x8 die configuration, 1w power, 22V 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 5050.
6. Refer to Table 6 and Table 7 for Bridgelux SMD 5050 Luminous Flux Binning and Forward Voltage Binning information.

Product Selection Guide

The following product configurations are available:

Table 2: Selection Guide, Stabilized DC Performance (T_{sp} = 85°C)[6,7]

Part Number[1,5]	Nominal CCT[2] (K)	CRI[3,4]	Nominal Drive Current (mA)	Forward Voltage[4] (V)			Typical DC Flux (lm)[4]	Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max			
BXEP-27C-181-24A-00-00-0	2700	70	45	20.2	21.4	23.9	166	0.96	172
BXEP-27E-181-24A-00-00-0	2700	80	45	20.2	21.4	23.9	148	0.96	153
BXEP-27G-181-24A-00-00-0	2700	90	45	20.2	21.4	23.9	127	0.96	132
BXEP-27H-181-24A-00-00-0	2700	94	45	20.2	21.4	23.9	122	0.96	127
BXEP-30C-181-24A-00-00-0	3000	70	45	20.2	21.4	23.9	169	0.96	176
BXEP-30E-181-24A-00-00-0	3000	80	45	20.2	21.4	23.9	154	0.96	160
BXEP-30G-181-24A-00-00-0	3000	90	45	20.2	21.4	23.9	130	0.96	135
BXEP-35C-181-24A-00-00-0	3500	70	45	20.2	21.4	23.9	172	0.96	179
BXEP-35E-181-24A-00-00-0	3500	80	45	20.2	21.4	23.9	159	0.96	165
BXEP-40C-181-24A-00-00-0	4000	70	45	20.2	21.4	23.9	174	0.96	181
BXEP-40E-181-24A-00-00-0	4000	80	45	20.2	21.4	23.9	162	0.96	168
BXEP-40G-181-24A-00-00-0	4000	90	45	20.2	21.4	23.9	140	0.96	145
BXEP-40H-181-24A-00-00-0	4000	94	45	20.2	21.4	23.9	134	0.96	139
BXEP-45C-181-24A-00-00-0	4500	70	45	20.2	21.4	23.9	174	0.96	181
BXEP-45E-181-24A-00-00-0	4500	80	45	20.2	21.4	23.9	162	0.96	168
BXEP-50C-181-24A-00-00-0	5000	70	45	20.2	21.4	23.9	174	0.96	181
BXEP-50E-181-24A-00-00-0	5000	80	45	20.2	21.4	23.9	162	0.96	168
BXEP-57C-181-24A-00-00-0	5700	70	45	20.2	21.4	23.9	174	0.96	181
BXEP-57E-181-24A-00-00-0	5700	80	45	20.2	21.4	23.9	160	0.96	167
BXEP-65C-181-24A-00-00-0	6500	70	45	20.2	21.4	23.9	172	0.96	179
BXEP-65E-181-24A-00-00-0	6500	80	45	20.2	21.4	23.9	159	0.96	166

Notes for Table 2:

1. The last 7 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-00-0" denotes the full distribution of flux, forward voltage, and 7 SDCM color.

   Example: BXEP-30E-181-24A-00-00-0 refers to the full distribution of flux, forward voltage, and color within a 3000K 7-step ANSI standard chromaticity region with a minimum of 80CRI, 1x8 die configuration, 1w power, 22V 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. 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 5050.
5. Refer to Table 6 and Table 7 for Bridgelux SMD 5050 Luminous Flux Binning and Forward Voltage Binning information.
6. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.
7. Typical performance is estimated based on operation under DC (direct 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.

Performance at Commonly Used Drive Currents

SMD 5050 LEDs are tested to the specifications shown using the nominal drive currents in Table 1. SMD 5050 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 2 and the relative luminous flux vs. current characteristics shown in Figure 3. The performance at commonly used drive currents is summarized in Table 3.

Table 3: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current[1] (mA)	Typical V_f T_{sp} = 25°C (V)	Typical Power T_{sp} = 25°C (W)	Typical Pulsed Flux[2] T_{sp} = 25°C (lm)	Typical DC Flux[3] T_{sp} = 85°C (lm)	Typical Efficacy T_{sp} = 25°C (lm/W)
BXEP-27C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**183**	**166**	**185**
		90	23.0	2.1	355	317	171
		135	23.9	3.2	514	452	159
		180	24.7	4.4	662	571	149
		225	25.3	5.7	798	675	140
		240	25.5	6.1	841	705	137
BXEP-27E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**163**	**148**	**165**
		90	23.0	2.1	316	282	152
		135	23.9	3.2	458	403	142
		180	24.7	4.4	590	509	133
		225	25.3	5.7	710	601	125
		240	25.5	6.1	749	628	122
BXEP-27G-181-24A-00-00-0	90	**45**	**22.0**	**1.0**	**140**	**127**	**141**
		90	23.0	2.1	271	243	131
		135	23.9	3.2	393	346	122
		180	24.7	4.4	506	437	114
		225	25.3	5.7	610	516	107
		240	25.5	6.1	643	540	105
BXEP-27H-181-24A-00-00-0	94	**45**	**22.0**	**1.0**	**135**	**122**	**136**
		90	23.0	2.1	261	233	126
		135	23.9	3.2	378	333	117
		180	24.7	4.4	487	420	110
		225	25.3	5.7	587	496	103
		240	25.5	6.1	618	519	101
BXEP-30C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**187**	**169**	**189**
		90	23.0	2.1	362	324	175
		135	23.9	3.2	525	462	163
		180	24.7	4.4	676	584	152
		225	25.3	5.7	815	689	143
		240	25.5	6.1	859	721	140

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 ± 7.5% 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

SMD 5050 LEDs are tested to the specifications shown using the nominal drive currents in Table 1. SMD 5050 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 2 and the relative luminous flux vs. current characteristics shown in Figure 3. The performance at commonly used drive currents is summarized in Table 3.

Table 3: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current[1] (mA)	Typical V_f T_{sp} = 25°C (V)	Typical Power T_{sp} = 25°C (W)	Typical Pulsed Flux[2] T_{sp} = 25°C (lm)	Typical DC Flux[3] T_{sp} = 85°C (lm)	Typical Efficacy T_{sp} = 25°C (lm/W)
BXEP-30E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**170**	**154**	**172**
		90	23.0	2.1	329	295	159
		135	23.9	3.2	478	420	148
		180	24.7	4.4	615	531	138
		225	25.3	5.7	741	627	130
		240	25.5	6.1	781	655	127
BXEP-30G-181-24A-00-00-0	90	**45**	**22.0**	**1.0**	**143**	**130**	**144**
		90	23.0	2.1	277	248	134
		135	23.9	3.2	402	353	124
		180	24.7	4.4	517	447	116
		225	25.3	5.7	623	527	109
		240	25.5	6.1	657	551	107
BXEP-35C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**190**	**172**	**192**
		90	23.0	2.1	368	329	178
		135	23.9	3.2	534	470	165
		180	24.7	4.4	687	593	155
		225	25.3	5.7	828	700	145
		240	25.5	6.1	873	732	142
BXEP-35E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**175**	**159**	**177**
		90	23.0	2.1	339	303	164
		135	23.9	3.2	492	433	152
		180	24.7	4.4	633	546	142
		225	25.3	5.7	763	645	134
		240	25.5	6.1	804	675	131
BXEP-40C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**192**	**174**	**194**
		90	23.0	2.1	372	333	180
		135	23.9	3.2	539	475	167
		180	24.7	4.4	694	600	156
		225	25.3	5.7	837	708	147
		240	25.5	6.1	882	740	144

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 ± 7.5% 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: Performance at Commonly Used Drive Currents (Continued)

Part Number	CRI	Drive Current[1] (mA)	Typical V_f T_{sp} = 25°C (V)	Typical Power T_{sp} = 25°C (W)	Typical Pulsed Flux[2] T_{sp} = 25°C (lm)	Typical DC Flux[3] T_{sp} = 85°C (lm)	Typical Efficacy T_{sp} = 25°C (lm/W)
BXEP-40E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**179**	**162**	**181**
		90	23.0	2.1	347	310	167
		135	23.9	3.2	503	442	156
		180	24.7	4.4	647	559	146
		225	25.3	5.7	780	660	137
		240	25.5	6.1	822	690	134
BXEP-40G-181-24A-00-00-0	90	**45**	**22.0**	**1.0**	**154**	**140**	**156**
		90	23.0	2.1	298	267	144
		135	23.9	3.2	433	381	134
		180	24.7	4.4	557	481	125
		225	25.3	5.7	671	568	118
		240	25.5	6.1	707	594	115
BXEP-40H-181-24A-00-00-0	94	**45**	**22.0**	**1.0**	**148**	**134**	**150**
		90	23.0	2.1	287	257	138
		135	23.9	3.2	416	366	129
		180	24.7	4.4	536	462	121
		225	25.3	5.7	645	546	113
		240	25.5	6.1	680	571	111
BXEP-45C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**192**	**174**	**194**
		90	23.0	2.1	372	333	180
		135	23.9	3.2	539	475	167
		180	24.7	4.4	694	600	156
		225	25.3	5.7	837	708	147
		240	25.5	6.1	882	740	144
BXEP-45E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**179**	**162**	**181**
		90	23.0	2.1	347	310	167
		135	23.9	3.2	503	442	156
		180	24.7	4.4	647	559	146
		225	25.3	5.7	780	660	137
		240	25.5	6.1	822	690	134

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 ± 7.5% 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: Performance at Commonly Used Drive Currents (Continued)

Part Number	CRI	Drive Current[1] (mA)	Typical V_f T_{sp} = 25°C (V)	Typical Power T_{sp} = 25°C (W)	Typical Pulsed Flux[2] T_{sp} = 25°C (lm)	Typical DC Flux[3] T_{sp} = 85°C (lm)	Typical Efficacy T_{sp} = 25°C (lm/W)
BXEP-50C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**192**	**174**	**194**
		90	23.0	2.1	372	333	180
		135	23.9	3.2	539	475	167
		180	24.7	4.4	694	600	156
		225	25.3	5.7	837	708	147
		240	25.5	6.1	882	740	144
BXEP-50E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**179**	**162**	**181**
		90	23.0	2.1	347	310	167
		135	23.9	3.2	503	442	156
		180	24.7	4.4	647	559	146
		225	25.3	5.7	780	660	137
		240	25.5	6.1	822	690	134
BXEP-57C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**192**	**174**	**194**
		90	23.0	2.1	372	333	180
		135	23.9	3.2	539	475	167
		180	24.7	4.4	694	600	156
		225	25.3	5.7	837	708	147
		240	25.5	6.1	882	740	144
BXEP-57E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**177**	**160**	**179**
		90	23.0	2.1	343	307	166
		135	23.9	3.2	497	437	154
		180	24.7	4.4	640	553	144
		225	25.3	5.7	771	652	135
		240	25.5	6.1	813	682	132
BXEP-65C-181-24A-00-00-0	70	**45**	**22.0**	**1.0**	**190**	**172**	**192**
		90	23.0	2.1	368	329	178
		135	23.9	3.2	534	470	165
		180	24.7	4.4	687	593	155
		225	25.3	5.7	828	700	145
		240	25.5	6.1	873	732	142
BXEP-65E-181-24A-00-00-0	80	**45**	**22.0**	**1.0**	**176**	**159**	**178**
		90	23.0	2.1	341	305	165
		135	23.9	3.2	494	435	153
		180	24.7	4.4	637	550	143
		225	25.3	5.7	767	649	135
		240	25.5	6.1	809	678	132

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 ± 7.5% 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 [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		
BXEP-XXX-181-24A-00-00-0	45	20.8	22	24.6	-10.6	3.1

Notes for Table 4:

1. The last 7 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-00-0" denotes the full distribution of flux, forward voltage, and 7 SDCM color.

   Example: BXEP-30E-181-24A-00-00-0 refers to the full distribution of flux, forward voltage, and color within a 3000K 7-step ANSI standard chromaticity region with a minimum of 80CRI, 1x8 die configuration, 1W power, 22V 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 T_{sp} = 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[1]	240mA
Maximum Peak Pulsed Forward Current[2]	300mA
Maximum Reverse Voltage	Bridgelux LEDs are not designed to be driven in reverse bias
Moisture Sensitivity Rating	MSL 3
Electrostatic Discharge	2kV HBM. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Notes for Table 5:

1. The condition of the maximum drive current is limited, Figure 7 can be reference.
2. 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.
3. The maximum drive current for LM80 test result is based on 356% nominal drive current listed.

Product Bin Definitions

Table 6 lists the standard photometric luminous flux bins for Bridgelux SMD 5050 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 45mA, T_{sp}=25˚C

Bin Code	Minimum	Maximum	Unit	Condition
Y6	120	130	lm	I_F=45mA
Y7	130	140		
Y8	140	150		
Y9	150	160		
Z1	160	170		
Z2	170	180		
Z3	180	195		
Z4	195	210		
Z5	210	225		

Note for Table 6:

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

Table 7: Forward Voltage Bin Definition at 45mA, T_{sp}=25˚C

Bin Code	Minimum	Maximum	Unit	Condition
FG	20	21	V	I_F=45mA
FH	21	22		
HD	22	23		
HE	23	24		
HF	24	25		

Note for Table 7:

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

Product Bin Definitions

Table 8: 3- and 5-step MacAdam Ellipse Color Bin Definitions

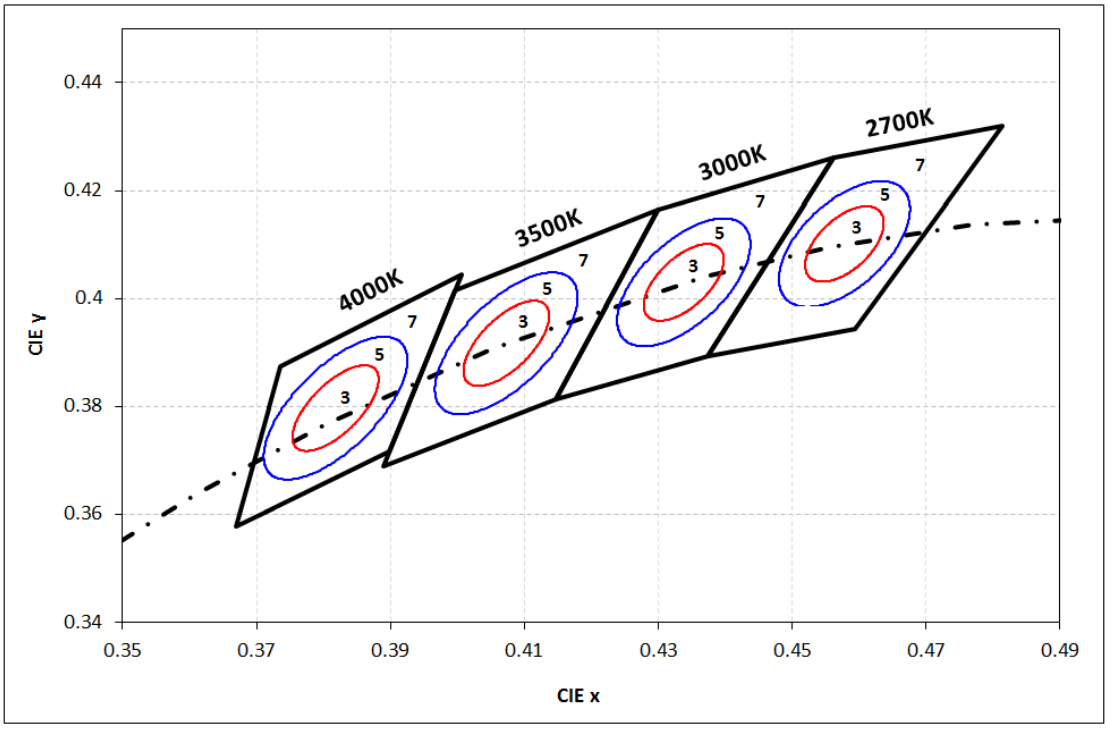
CCT	Color Space	Center Point		Major Axis	Minor Axis	Ellipse Rotation Angle	Color Bin
		X	Y				
2700K	3 SDCM	0.4578	0.4101	0.00810	0.00420	53.70	3
	5 SDCM	0.4578	0.4101	0.01350	0.00700	53.70	5
3000K	3 SDCM	0.4338	0.4030	0.00834	0.00408	53.22	3
	5 SDCM	0.4338	0.4030	0.01390	0.00680	53.22	5
3500K	3 SDCM	0.4103	0.3961	0.00927	0.00414	54.00	3
	5 SDCM	0.4103	0.3961	0.01545	0.00690	54.00	5
4000K	3 SDCM	0.3818	0.3797	0.00939	0.00402	53.72	3
	5 SDCM	0.3818	0.3797	0.01565	0.00670	53.72	5
4500K	3 SDCM	0.3611	0.3658	0.00756	0.00338	57.58	3
	5 SDCM	0.3611	0.3658	0.01260	0.00563	57.58	5
5000K	3 SDCM	0.3447	0.3553	0.00822	0.00354	59.62	3
	5 SDCM	0.3447	0.3553	0.01370	0.00590	59.62	5
5700K	3 SDCM	0.3287	0.3417	0.00746	0.00320	59.09	3
	5 SDCM	0.3287	0.3417	0.01243	0.00533	59.09	5
6500K	3 SDCM	0.3123	0.3282	0.00669	0.00285	58.57	3
	5 SDCM	0.3123	0.3282	0.01115	0.00475	58.57	5

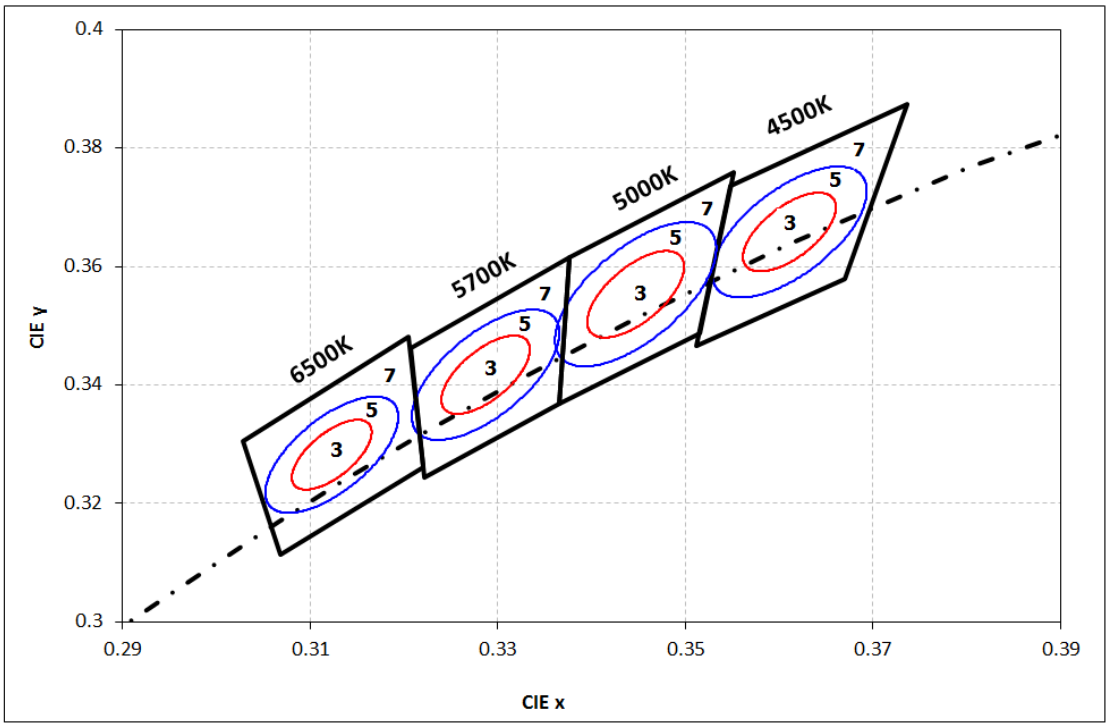
Notes for Table 8:

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

Product Bin Definitions

Figure 1: C.I.E. 1931 Chromaticity Diagram (3 Color Bin Structure, hot-color targeted at T_{sp}=85˚C)





Performance Curves

Figure 2: Drive Current vs. Voltage (T_{sp}=25˚C)

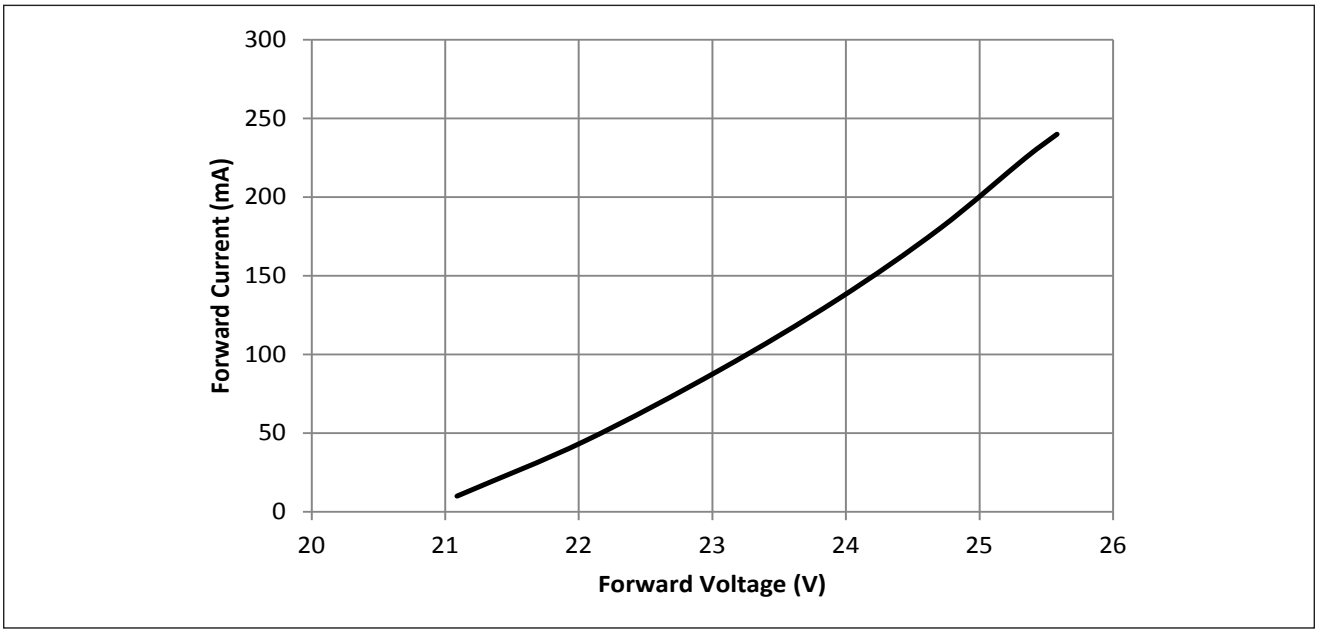
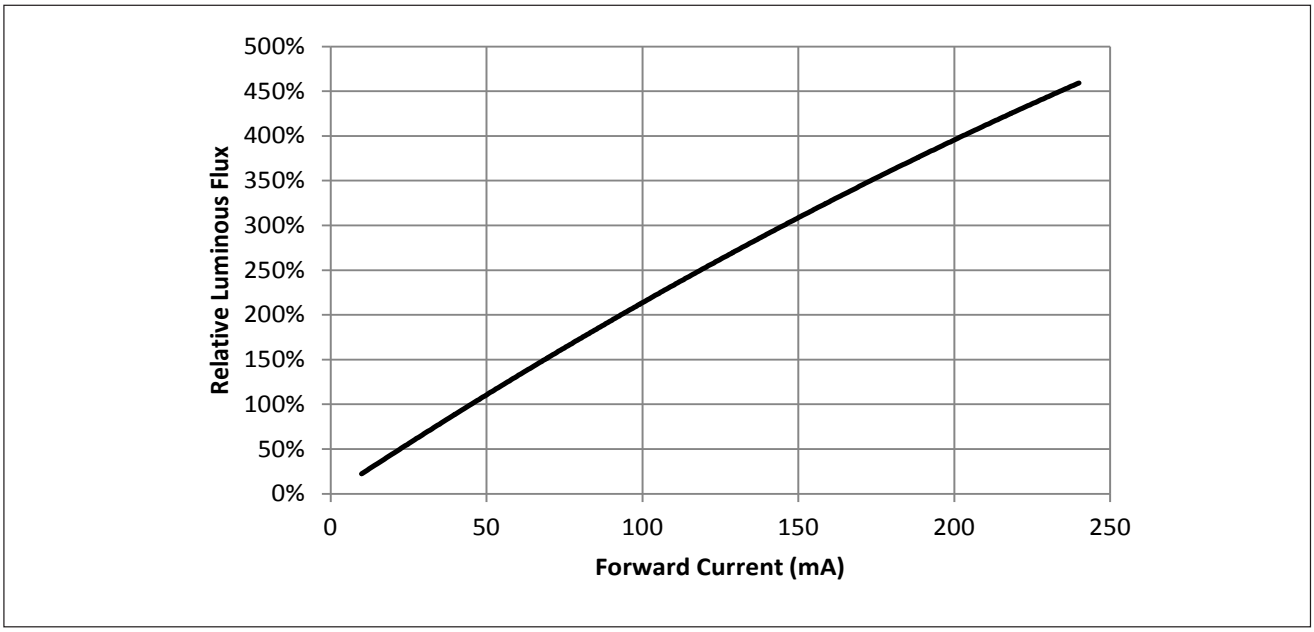


Figure 3: Typical Relative Luminous Flux vs. Drive Current (T_{sp}=25˚C)



Note for Figure 3:

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.

Performance Curves

Figure 4: Typical Relative DC Flux vs. Solder Point Temperature

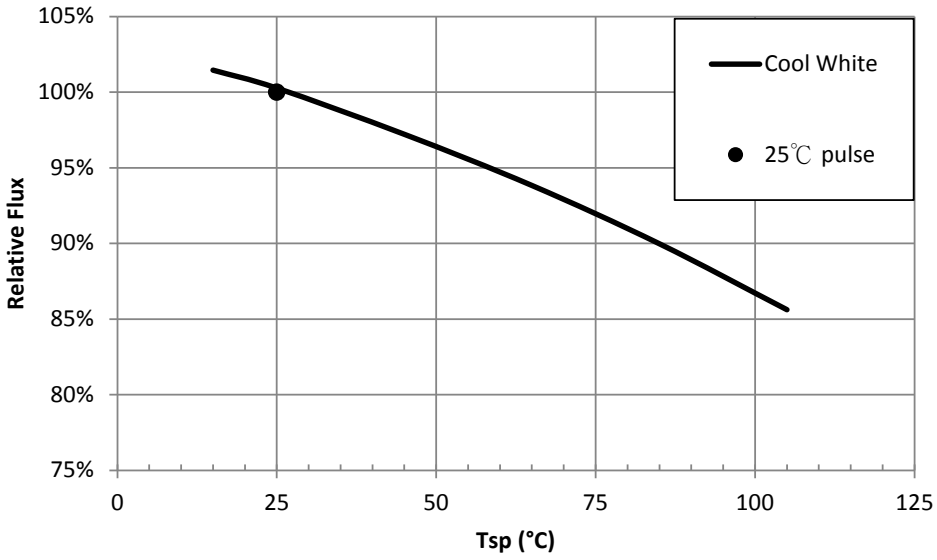
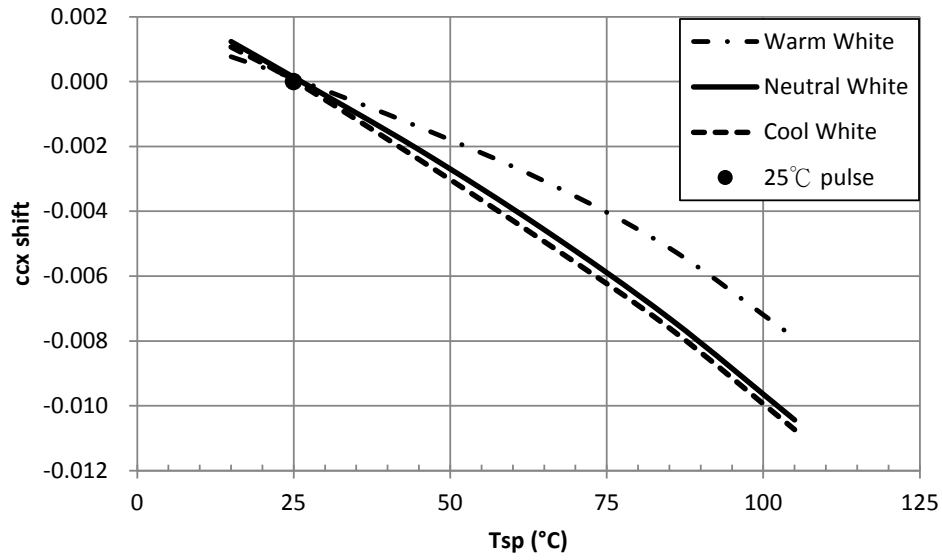


Figure 5: Typical DC ccx Shift vs. Solder Point Temperature

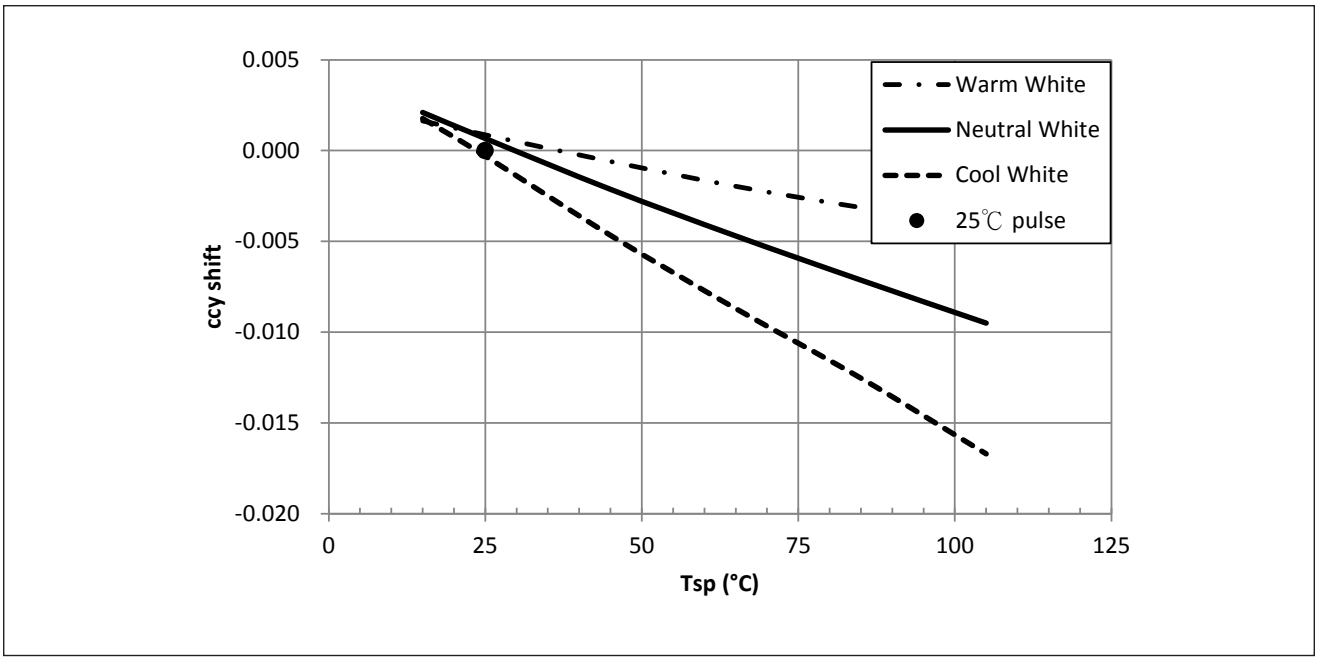


Notes for Figures 4 & 5:

1. Characteristics shown for warm white based on 2700K and 80 CRI.
2. Characteristics shown for neutral white based on 4000K and 80 CRI.
3. Characteristics shown for cool white based on 5700K and 80 CRI.
4. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information.

Performance Curves

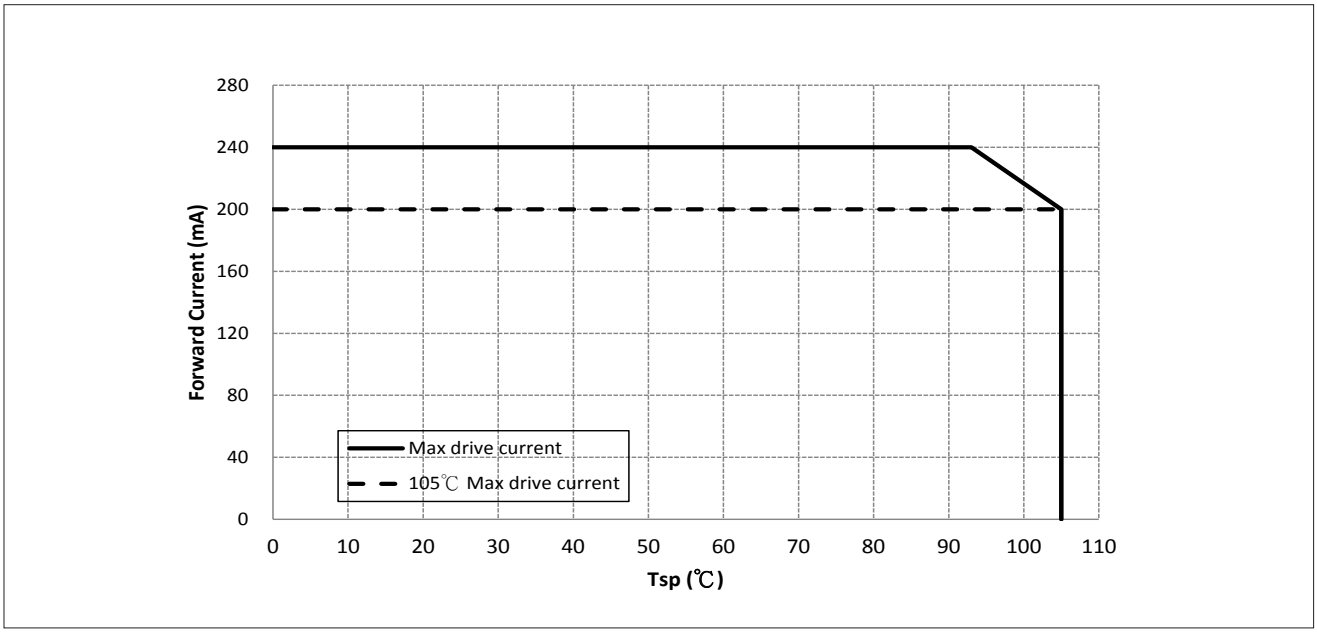
Figure 6: Typical DC ccy Shift vs. Solder Point Temperature



Notes for Figure 6:

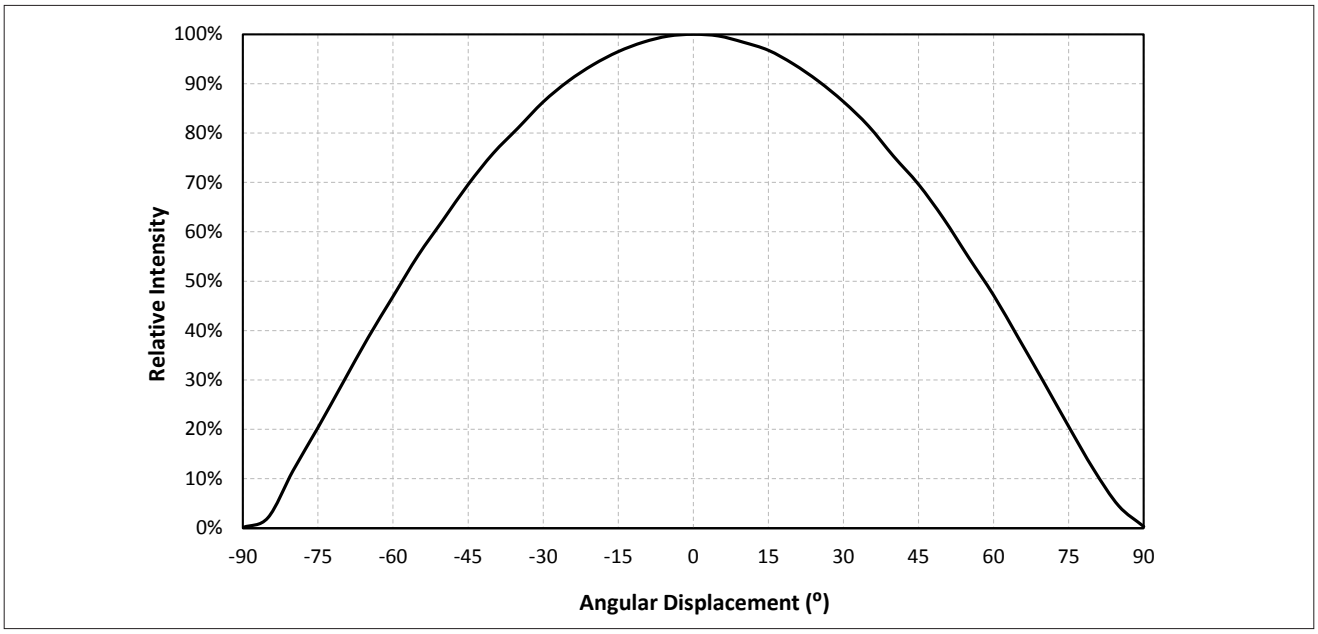
1. Characteristics shown for warm white based on 2700K and 80 CRI.
2. Characteristics shown for neutral white based on 4000K and 80 CRI.
3. Characteristics shown for cool white based on 5700K and 80 CRI.
4. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information.

Figure 7: Drive Current Derating Curve



Typical Radiation Pattern

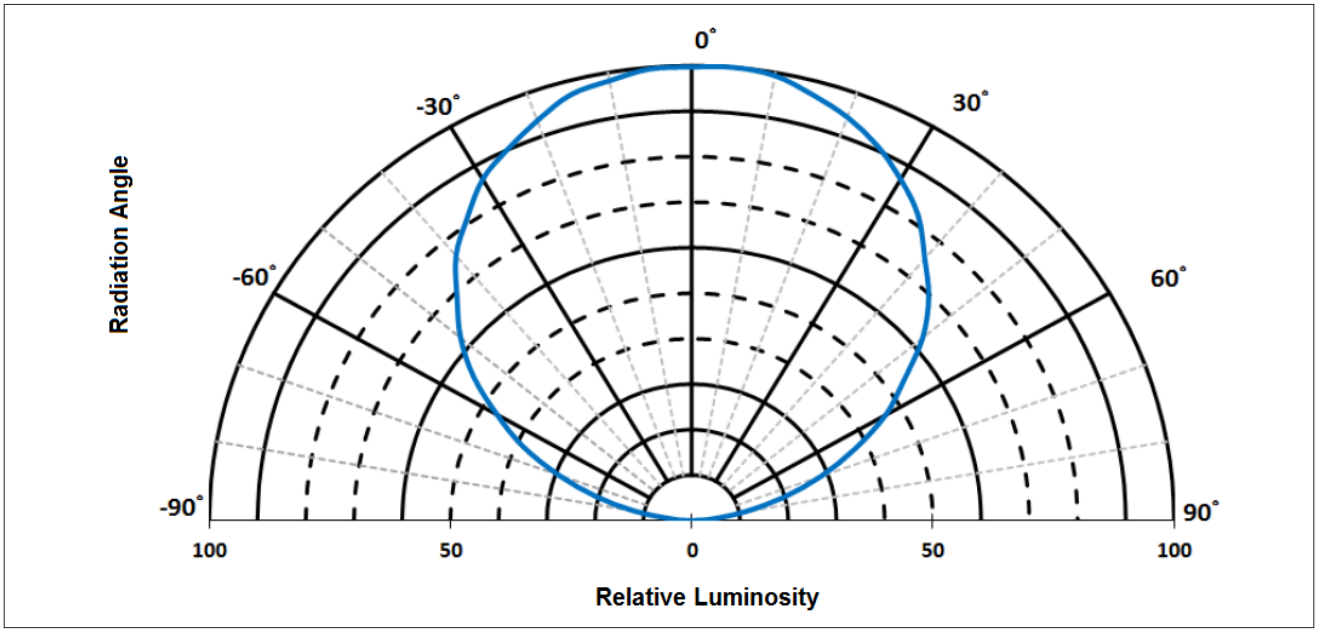
Figure 8: Typical Spatial Radiation Pattern at 45mA, T_{sp}=25˚C



Notes for Figure 8:

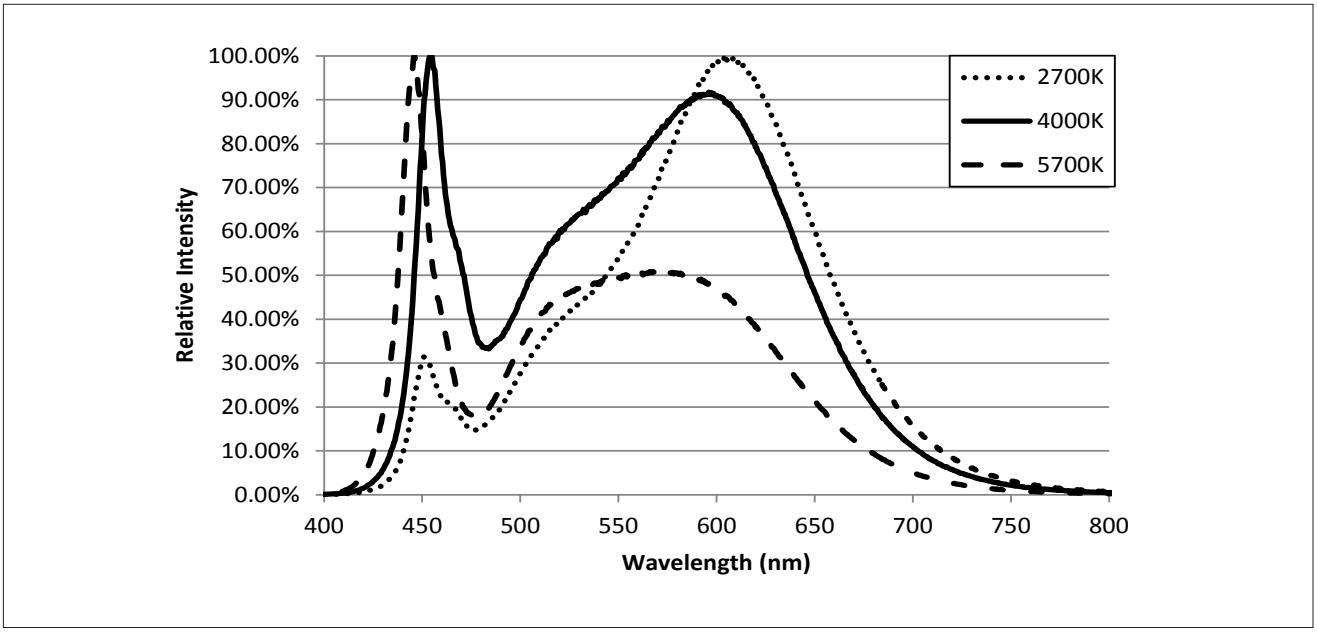
1. Typical viewing angle is 116°.
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (Iv) is ½ of the peak value.

Figure 9: Typical Polar Radiation Pattern at 45mA, T_{sp}=25˚C



Typical Color Spectrum

Figure 10: Typical Color Spectrum

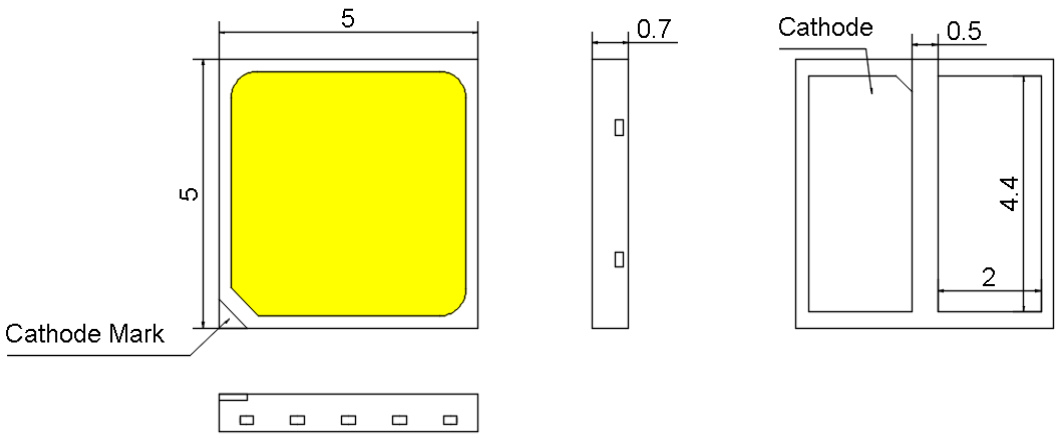


Notes for Figure 10:

1. Color spectra measured at nominal current for T_{sp} = 25˚C
2. Color spectra shown for warm white is 2700K and 80 CRI.
3. Color spectra shown for neutral white is 4000K and 80 CRI.
4. Color spectra shown for cool white is 5700K and 80 CRI.

Mechanical Dimensions

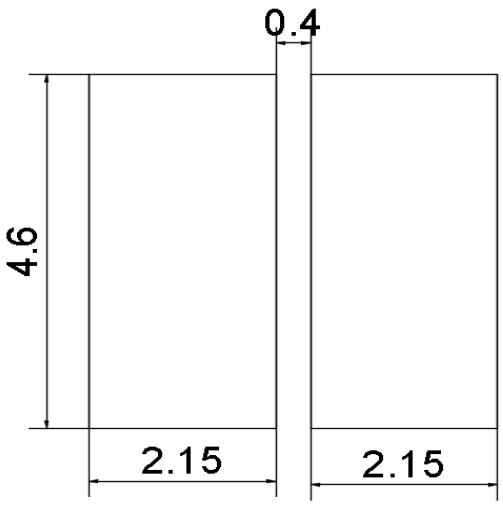
Figure 11: Drawing for SMD 5050



Notes for Figure 11:

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	160mA	1000 hours	0/22
5	Temperature Humidity Operating Life	JESD22-A101C	T_{sp}=85˚C, RH=85%	160mA	1000 hours	0/22
6	High Temperature Operating Life	JESD22-A108D	T_{sp}=105˚C	200mA	1000 hours	0/22
7	Power switching	IEC62717:2014	T_{sp}= 105˚C 30 sec on, 30 sec off	200mA	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

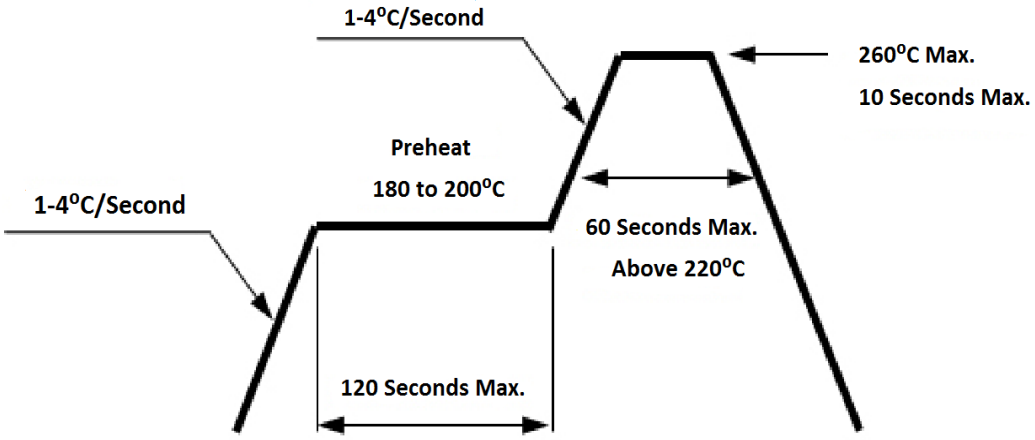
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	45mA	ΔVf<10%
Luminous Flux	Fv	45mA	ΔFv<30%
Chromaticity Coordinates	(x, y)	45mA	Δu'v'<0.007

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

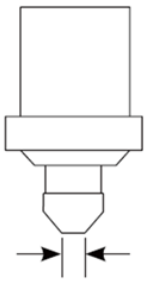
Reflowing Characteristics

Figure 12 : Reflow Profile



Profile Feature	Lead Free Assembly
Preheat: Temperature Range	180˚C – 200˚C
Preheat: Time (Maximum)	120 seconds
Peak Temperature	260˚C
Soldering Time (Maximum)	10 seconds
Allowable Reflow Cycles	2

Figure 13 : Pick and Place

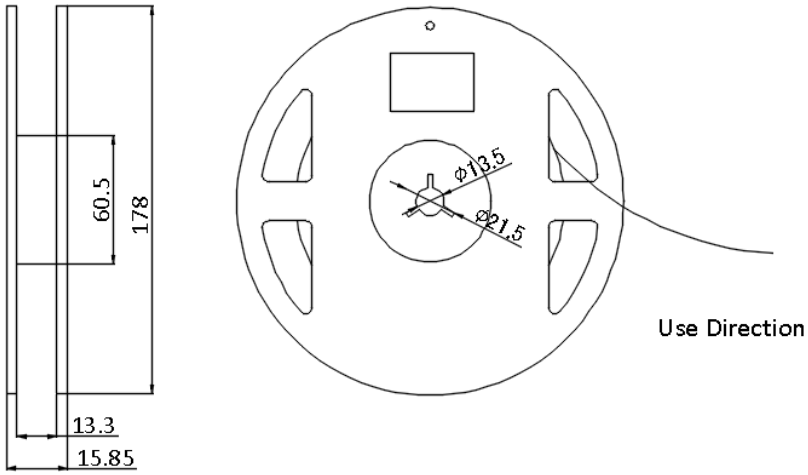


Note for Figure 13:

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

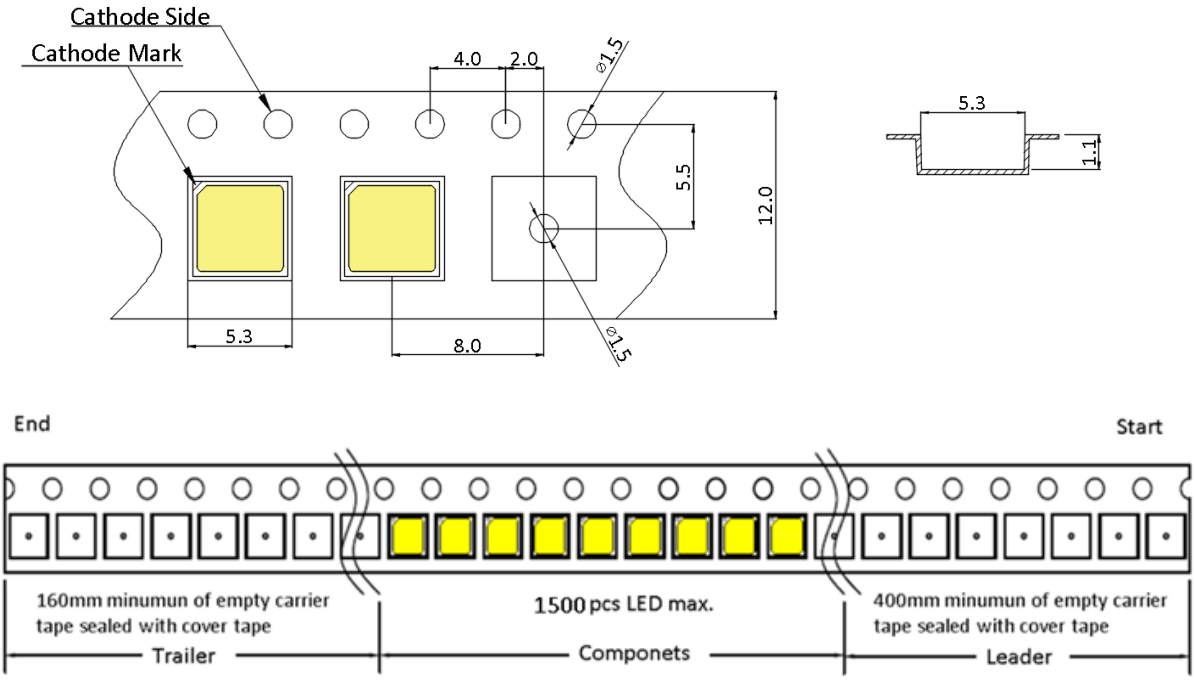
Figure 14: Emitter Reel Drawings



Note for Figure 14:

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

Figure 15: Emitter Tape Drawings

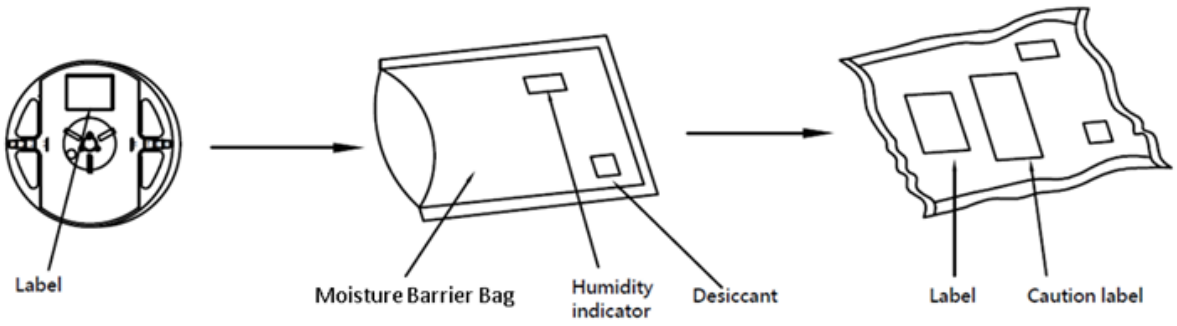


Note for Figure 15:

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

Packaging

Figure 16: Emitter Reel Packaging Drawings



Note for Figure 16:

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 EN62471: Photobiological Safety of Lamps and Lamp Systems. SMD LED emitters are classified as Risk Group 2 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: We Build Light That Transforms

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

For more information about the company, please visit
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