



Bridgelux® SMD 3030 1W 6V

Product Data Sheet DS904

Introduction

SMD 3030



Features

- Industry-standard 3030 footprint
- Enables 3- and 6-step MacAdam ellipse custom binning kits
- RoHS compliant and lead free
- Multiple CCT configurations for a wide range of lighting applications

Benefits

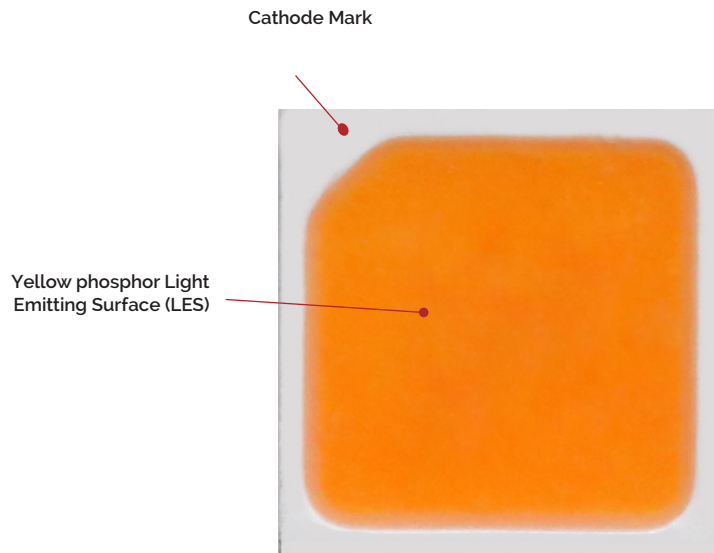
- Lower operating and manufacturing cost
- Ease of design and rapid go-to-market
- Uniform, consistent white light
- Reliable and constant white point
- Compliant with environmental standards
- Design flexibility

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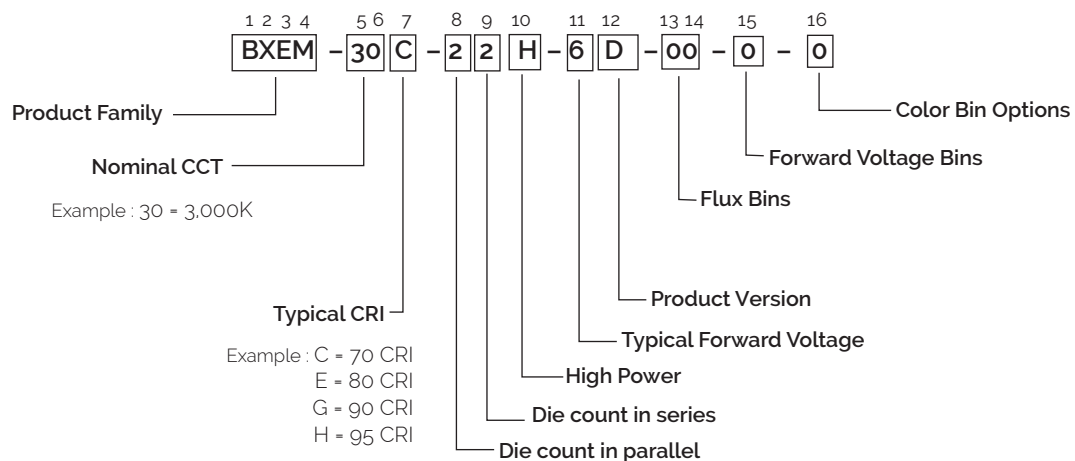
Product Feature Map

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 3030 is explained as follows:



Product Selection Guide

The following product configurations are available:

Table 1: Selection Guide, Pulsed Measurement Data at 150mA ($T_j = T_{sp} = 25^\circ\text{C}$)

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			
BXEM-27C-22H-6D-00-0-0	2700	70	150	5.5	5.8	6.2	147	0.9	169
BXEM-27E-22H-6D-00-0-0	2700	80	150	5.5	5.8	6.2	135	0.9	155
BXEM-27G-22H-6D-00-0-0	2700	90	150	5.5	5.8	6.2	116	0.9	134
BXEM-29C-22H-6D-00-0-0	2900	70	150	5.5	5.8	6.2	151	0.9	174
BXEM-30C-22H-6D-00-0-0	3000	70	150	5.5	5.8	6.2	151	0.9	174
BXEM-30E-22H-6D-00-0-0	3000	80	150	5.5	5.8	6.2	140	0.9	161
BXEM-30G-22H-6D-00-0-0	3000	90	150	5.5	5.8	6.2	121	0.9	139
BXEM-30H-22H-6D-00-0-0	3000	95	150	5.5	5.8	6.2	102	0.9	117
BXEM-35C-22H-6D-00-0-0	3500	70	150	5.5	5.8	6.2	156	0.9	179
BXEM-35E-22H-6D-00-0-0	3500	80	150	5.5	5.8	6.2	142	0.9	163
BXEM-35G-22H-6D-00-0-0	3500	90	150	5.5	5.8	6.2	122	0.9	141
BXEM-35H-22H-6D-00-0-0	3500	95	150	5.5	5.8	6.2	108	0.9	124
BXEM-40C-22H-6D-00-0-0	4000	70	150	5.5	5.8	6.2	160	0.9	184
BXEM-40E-22H-6D-00-0-0	4000	80	150	5.5	5.8	6.2	147	0.9	169
BXEM-40G-22H-6D-00-0-0	4000	90	150	5.5	5.8	6.2	127	0.9	146
BXEM-40H-22H-6D-00-0-0	4000	95	150	5.5	5.8	6.2	111	0.9	128
BXEM-50C-22H-6D-00-0-0	5000	70	150	5.5	5.8	6.2	160	0.9	184
BXEM-50E-22H-6D-00-0-0	5000	80	150	5.5	5.8	6.2	147	0.9	169
BXEM-50G-22H-6D-00-0-0	5000	90	150	5.5	5.8	6.2	127	0.9	146
BXEM-57C-22H-6D-00-0-0	5700	70	150	5.5	5.8	6.2	157	0.9	180
BXEM-57E-22H-6D-00-0-0	5700	80	150	5.5	5.8	6.2	145	0.9	167
BXEM-57G-22H-6D-00-0-0	5700	90	150	5.5	5.8	6.2	125	0.9	144
BXEM-62E-22H-6D-00-0-0	6200	80	150	5.5	5.8	6.2	143	0.9	164
BXEM-65C-22H-6D-00-0-0	6500	70	150	5.5	5.8	6.2	155	0.9	178
BXEM-65E-22H-6D-00-0-0	6500	80	150	5.5	5.8	6.2	143	0.9	164
BXEM-65G-22H-6D-00-0-0	6500	90	150	5.5	5.8	6.2	123	0.9	142

Notes for Table 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 color bin.
Example: BXEM-30C-22H-6D-00-0-0 refers to the full distribution of flux, forward voltage, and color within a 3000K 6-step ANSI standard chromaticity region with a typical of 70CRI, 2x2 die configuration, high power, 5.8V typical forward voltage.
- Product CCT is cold targeted at $T_{sp} = 25^\circ\text{C}$. Nominal CCT as defined by ANSI C78.377-2011.
- Listed CRIs are typical values.
- Products tested under pulsed condition (10ms pulse width) at nominal drive current.
- Bridgelux maintains a $\pm 7.5\%$ tolerance on luminous flux measurements, $\pm 0.15\text{V}$ tolerance on forward voltage measurements, and ± 2 tolerance on CRI measurements for the SMD 3030.
- Refer to Table 5 and Table 6 for Bridgelux SMD 3030 Luminous Flux Binning and Forward Voltage Binning information.
- Typical pulsed test performance values are provided as reference only and are not a guarantee of performance.
- 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 25°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 3030 LEDs are tested to the specifications shown using the nominal drive currents in Table 1. SMD 3030 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 2.

Table 2: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_{sp} = 25^\circ\text{C}$ (V)	Typical Power $T_{sp} = 25^\circ\text{C}$ (W)	Typical Pulsed Flux ² $T_{sp} = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_{sp} = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_{sp} = 25^\circ\text{C}$ (lm/W)
BXEM-27C-22H-6D-00-0-0	70	50	5.5	0.3	52	47	188
		100	5.7	0.6	101	92	178
		150	5.8	0.9	147	134	169
		200	5.9	1.2	191	174	161
		250	6.1	1.5	233	212	154
		300	6.2	1.9	272	248	147
		350	6.3	2.2	310	282	141
BXEM-27E-22H-6D-00-0-0	80	50	5.5	0.3	47	43	173
		100	5.7	0.6	92	84	163
		150	5.8	0.9	135	123	155
		200	5.9	1.2	176	160	148
		250	6.1	1.5	214	195	141
		300	6.2	1.9	250	228	135
		350	6.3	2.2	285	259	129
BXEM-27G-22H-6D-00-0-0	90	50	5.5	0.3	41	37	149
		100	5.7	0.6	80	73	141
		150	5.8	0.9	116	106	134
		200	5.9	1.2	151	138	128
		250	6.1	1.5	184	168	122
		300	6.2	1.9	216	196	116
		350	6.3	2.2	246	224	112
BXEM-29C-22H-6D-00-0-0	70	50	5.5	0.3	53	48	193
		100	5.7	0.6	103	94	183
		150	5.8	0.9	151	137	174
		200	5.9	1.2	196	179	166
		250	6.1	1.5	239	218	158
		300	6.2	1.9	280	255	151
		350	6.3	2.2	319	290	145
BXEM-30C-22H-6D-00-0-0	70	50	5.5	0.3	53	48	193
		100	5.7	0.6	103	94	183
		150	5.8	0.9	151	137	174
		200	5.9	1.2	196	179	166
		250	6.1	1.5	239	218	158
		300	6.2	1.9	280	255	151
		350	6.3	2.2	319	290	145

Performance at Commonly Used Drive Currents

Table 2: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_{sp} = 25^\circ\text{C}$ (V)	Typical Power $T_{sp} = 25^\circ\text{C}$ (W)	Typical Pulsed Flux ² $T_{sp} = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_{sp} = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_{sp} = 25^\circ\text{C}$ (lm/W)
BXEM-30E-22H-6D-00-0-0	80	50	5.5	0.3	49	45	179
		100	5.7	0.6	96	87	170
		150	5.8	0.9	140	127	161
		200	5.9	1.2	182	166	153
		250	6.1	1.5	222	202	146
		300	6.2	1.9	259	236	140
		350	6.3	2.2	296	269	134
BXEM-30G-22H-6D-00-0-0	90	50	5.5	0.3	42	39	155
		100	5.7	0.6	83	75	146
		150	5.8	0.9	121	110	139
		200	5.9	1.2	157	143	132
		250	6.1	1.5	191	174	126
		300	6.2	1.9	224	204	121
		350	6.3	2.2	255	232	116
BXEM-30H-22H-6D-00-0-0	95	50	5.5	0.3	36	33	131
		100	5.7	0.6	70	64	124
		150	5.8	0.9	102	93	117
		200	5.9	1.2	133	121	112
		250	6.1	1.5	162	147	107
		300	6.2	1.9	189	172	102
		350	6.3	2.2	215	196	98
BXEM-35C-22H-6D-00-0-0	70	50	5.5	0.3	55	50	200
		100	5.7	0.6	107	97	189
		150	5.8	0.9	156	142	179
		200	5.9	1.2	203	185	171
		250	6.1	1.5	247	225	163
		300	6.2	1.9	289	263	156
		350	6.3	2.2	329	300	150
BXEM-35E-22H-6D-00-0-0	80	50	5.5	0.3	50	45	182
		100	5.7	0.6	97	89	172
		150	5.8	0.9	142	129	163
		200	5.9	1.2	185	168	156
		250	6.1	1.5	225	205	149
		300	6.2	1.9	263	239	142
		350	6.3	2.2	300	273	136

Performance at Commonly Used Drive Currents

Table 2: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_{sp} = 25^\circ\text{C}$ (V)	Typical Power $T_{sp} = 25^\circ\text{C}$ (W)	Typical Pulsed Flux ² $T_{sp} = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_{sp} = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_{sp} = 25^\circ\text{C}$ (lm/W)
BXEM-35G-22H-6D-00-0-0	90	50	5.5	0.3	43	39	157
		100	5.7	0.6	84	76	148
		150	5.8	0.9	122	111	141
		200	5.9	1.2	159	145	134
		250	6.1	1.5	194	176	128
		300	6.2	1.9	227	206	122
		350	6.3	2.2	258	235	117
BXEM-35H-22H-6D-00-0-0	95	50	5.5	0.3	38	35	138
		100	5.7	0.6	74	67	131
		150	5.8	0.9	108	98	124
		200	5.9	1.2	140	128	118
		250	6.1	1.5	171	156	113
		300	6.2	1.9	200	182	108
		350	6.3	2.2	228	207	104
BXEM-40C-22H-6D-00-0-0	70	50	5.5	0.3	56	51	205
		100	5.7	0.6	110	100	194
		150	5.8	0.9	160	146	184
		200	5.9	1.2	208	189	175
		250	6.1	1.5	253	231	167
		300	6.2	1.9	297	270	160
		350	6.3	2.2	338	307	153
BXEM-40E-22H-6D-00-0-0	80	50	5.5	0.3	52	47	188
		100	5.7	0.6	101	92	178
		150	5.8	0.9	147	134	169
		200	5.9	1.2	191	174	161
		250	6.1	1.5	233	212	154
		300	6.2	1.9	272	248	147
		350	6.3	2.2	310	282	141
BXEM-40G-22H-6D-00-0-0	90	50	5.5	0.3	45	41	162
		100	5.7	0.6	87	79	153
		150	5.8	0.9	127	115	146
		200	5.9	1.2	165	150	139
		250	6.1	1.5	201	183	133
		300	6.2	1.9	235	214	127
		350	6.3	2.2	267	243	121

Performance at Commonly Used Drive Currents

Table 2: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_{sp} = 25^\circ\text{C}$ (V)	Typical Power $T_{sp} = 25^\circ\text{C}$ (W)	Typical Pulsed Flux ² $T_{sp} = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_{sp} = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_{sp} = 25^\circ\text{C}$ (lm/W)
BXEM-40H-22H-6D-00-0-0	95	50	5.5	0.3	39	36	142
		100	5.7	0.6	76	69	134
		150	5.8	0.9	111	101	128
		200	5.9	1.2	144	131	122
		250	6.1	1.5	176	160	116
		300	6.2	1.9	206	187	111
		350	6.3	2.2	234	213	106
BXEM-50C-22H-6D-00-0-0	70	50	5.5	0.3	56	51	205
		100	5.7	0.6	110	100	194
		150	5.8	0.9	160	146	184
		200	5.9	1.2	208	189	175
		250	6.1	1.5	253	231	167
		300	6.2	1.9	297	270	160
		350	6.3	2.2	338	307	153
BXEM-50E-22H-6D-00-0-0	80	50	5.5	0.3	52	47	188
		100	5.7	0.6	101	92	178
		150	5.8	0.9	147	134	169
		200	5.9	1.2	191	174	161
		250	6.1	1.5	233	212	154
		300	6.2	1.9	272	248	147
		350	6.3	2.2	310	282	141
BXEM-50G-22H-6D-00-0-0	90	50	5.5	0.3	45	41	162
		100	5.7	0.6	87	79	153
		150	5.8	0.9	127	115	146
		200	5.9	1.2	165	150	139
		250	6.1	1.5	201	183	133
		300	6.2	1.9	235	214	127
		350	6.3	2.2	267	243	121
BXEM-57C-22H-6D-00-0-0	70	50	5.5	0.3	55	50	201
		100	5.7	0.6	108	98	190
		150	5.8	0.9	157	143	180
		200	5.9	1.2	204	186	172
		250	6.1	1.5	249	226	164
		300	6.2	1.9	291	265	157
		350	6.3	2.2	331	302	151

Performance at Commonly Used Drive Currents

Table 2: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_{sp} = 25^\circ\text{C}$ (V)	Typical Power $T_{sp} = 25^\circ\text{C}$ (W)	Typical Pulsed Flux ² $T_{sp} = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_{sp} = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_{sp} = 25^\circ\text{C}$ (lm/W)
BXEM-57E-22H-6D-00-0-0	80	50	5.5	0.3	51	46	186
		100	5.7	0.6	99	90	176
		150	5.8	0.9	145	132	167
		200	5.9	1.2	189	172	159
		250	6.1	1.5	230	209	152
		300	6.2	1.9	269	245	145
		350	6.3	2.2	306	279	139
BXEM-57G-22H-6D-00-0-0	90	50	5.5	0.3	44	40	160
		100	5.7	0.6	86	78	151
		150	5.8	0.9	125	114	144
		200	5.9	1.2	163	148	137
		250	6.1	1.5	198	180	131
		300	6.2	1.9	232	211	125
		350	6.3	2.2	264	240	120
BXEM-62E-22H-6D-00-0-0	80	50	5.5	0.3	50	46	183
		100	5.7	0.6	98	89	173
		150	5.8	0.9	143	130	164
		200	5.9	1.2	186	169	157
		250	6.1	1.5	226	206	150
		300	6.2	1.9	265	241	143
		350	6.3	2.2	302	275	137
BXEM-65C-22H-6D-00-0-0	70	50	5.5	0.3	55	50	199
		100	5.7	0.6	106	97	188
		150	5.8	0.9	155	141	178
		200	5.9	1.2	202	183	170
		250	6.1	1.5	245	223	162
		300	6.2	1.9	287	261	155
		350	6.3	2.2	327	298	149
BXEM-65E-22H-6D-00-0-0	80	50	5.5	0.3	50	46	183
		100	5.7	0.6	98	89	173
		150	5.8	0.9	143	130	164
		200	5.9	1.2	186	169	157
		250	6.1	1.5	226	206	150
		300	6.2	1.9	265	241	143
		350	6.3	2.2	302	275	137

Performance at Commonly Used Drive Currents

Table 2: Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V_f $T_{sp} = 25^\circ\text{C}$ (V)	Typical Power $T_{sp} = 25^\circ\text{C}$ (W)	Typical Pulsed Flux ² $T_{sp} = 25^\circ\text{C}$ (lm)	Typical DC Flux ³ $T_{sp} = 85^\circ\text{C}$ (lm)	Typical Efficacy $T_{sp} = 25^\circ\text{C}$ (lm/W)
BXEM-65G-22H-6D-00-0-0	90	50	5.5	0.3	43	39	158
		100	5.7	0.6	84	77	149
		150	5.8	0.9	123	112	142
		200	5.9	1.2	160	146	135
		250	6.1	1.5	195	178	129
		300	6.2	1.9	228	208	123
		350	6.3	2.2	260	237	118

Notes for Table 2:

1. Alternate drive currents in Table 2 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a $\pm 7.5\%$ 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 3: Electrical Characteristics

Part Number ¹	Drive Current (mA)	Forward Voltage (V) ²			Typical Temperature Coefficient of Forward Voltage $\Delta V_f / \Delta T$ (mV/°C)	Typical Thermal Resistance Junction to Solder Point ³ R_{j-sp} (°C/W)
		Minimum	Typical	Maximum		
BXEM-XXX-22H-6D-00-0-0	150	5.5	5.8	6.2	-2.2	12.5

Notes for Table 3:

1. Bridgelux maintains a tolerance of $\pm 0.15V$ on forward voltage measurements. Voltage minimum and maximum values at the nominal drive current are guaranteed by 100% test.
2. Products tested under pulsed condition (10ms pulse width) at nominal drive current where $T_{sp} = 25^{\circ}C$.
3. Thermal resistance value was calculated using total electrical input power; optical power was not subtracted from input power.

Absolute Maximum Ratings

Table 4: 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	350mA
Maximum Peak Pulsed Forward Current ¹	700mA
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 4:

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 5 lists the standard photometric luminous flux bins for Bridgelux SMD 3030 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 5: Luminous Flux Bin Definitions at 150mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
09	90	100	lm	$I_F=150\text{mA}$
10	100	110		
11	110	120		
12	120	130		
13	130	140		
14	140	150		
15	150	160		
16	160	170		

Note for Table 5:

1. Bridgelux maintains a tolerance of $\pm 7.5\%$ on luminous flux measurements.

Table 6: Forward Voltage Bin Definition at 150mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
M	5.4	5.6	V	$I_F=150\text{mA}$
N	5.6	5.8		
P	5.8	6.0		
Q	6.0	6.2		

Note for Table 6:

1. Bridgelux maintains a tolerance of $\pm 0.15\text{V}$ on forward voltage measurements.

Product Bin Definitions

Table 7: MacAdam Ellipse Color Bin Definitions

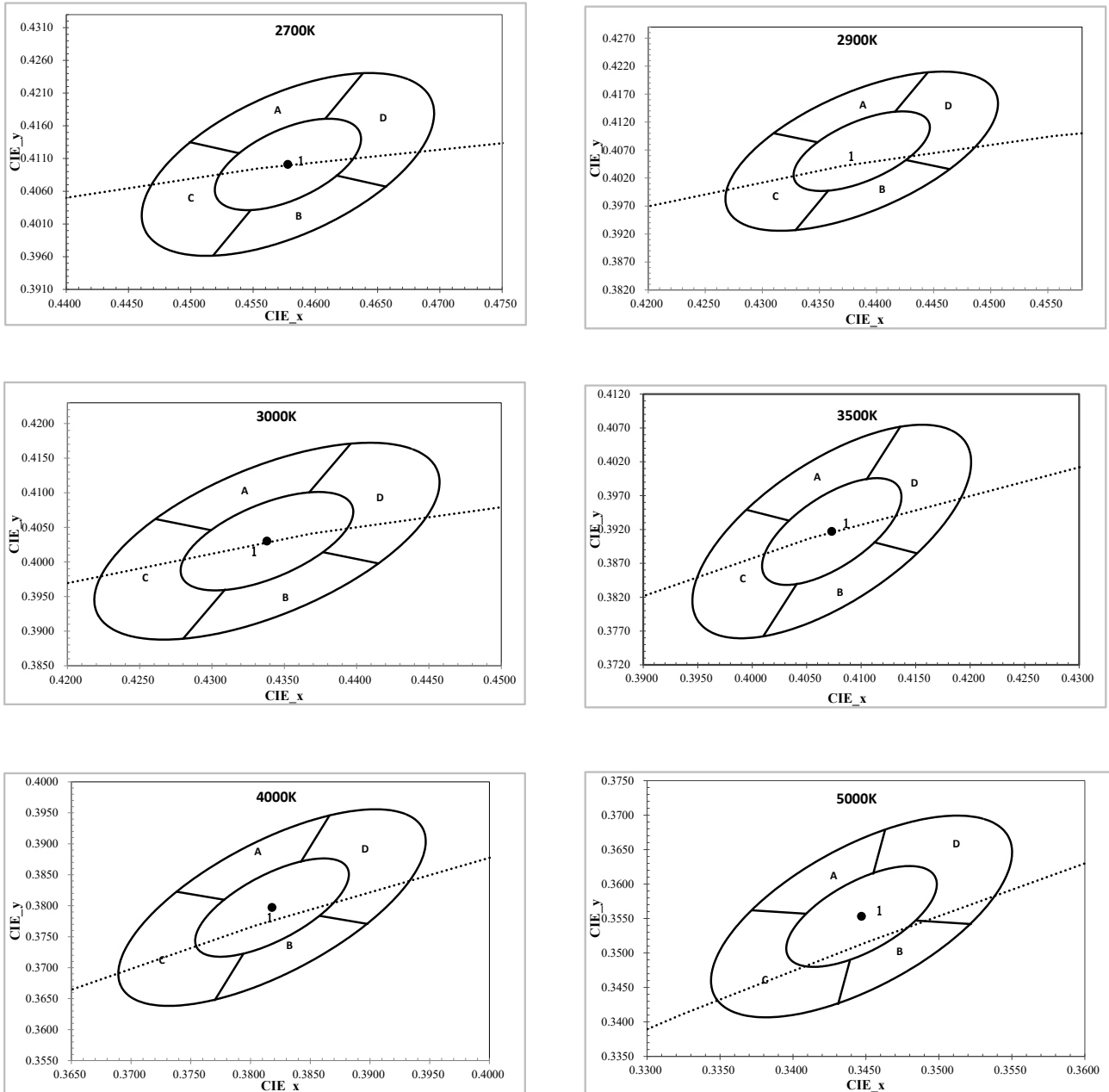
CCT	Color Space	Center Point		Major Axis	Minor Axis	Ellipse Rotation Angle	Color Bin
		X	Y				
2700K	3 SDCM	0.4578	0.4101	0.0081	0.0042	53.7	1
	6 SDCM	0.4578	0.4101	0.0162	0.0084	53.7	1/A/B/C/D
2900K	3 SDCM	0.4387	0.4068	0.0083	0.0041	53.2	1
	6 SDCM	0.4387	0.4068	0.0167	0.0082	53.2	1/A/B/C/D
3000K	3 SDCM	0.4338	0.4030	0.0083	0.0041	53.2	1
	6 SDCM	0.4338	0.4030	0.0167	0.0082	53.2	1/A/B/C/D
3500K	3 SDCM	0.4073	0.3917	0.0094	0.0040	54.0	1
	6 SDCM	0.4073	0.3917	0.0185	0.0083	54.0	1/A/B/C/D
4000K	3 SDCM	0.3818	0.3797	0.0094	0.0040	53.7	1
	6 SDCM	0.3818	0.3797	0.0188	0.0080	53.7	1/A/B/C/D
5000K	3 SDCM	0.3447	0.3553	0.0082	0.0035	59.6	1
	6 SDCM	0.3447	0.3553	0.0164	0.0071	59.6	1/A/B/C/D
5700K	3 SDCM	0.3287	0.3417	0.0082	0.0035	59.1	1
	6 SDCM	0.3287	0.3417	0.0149	0.0064	59.1	1/A/B/C/D
6200K	3 SDCM	0.3160	0.3488	0.0067	0.0029	58.6	1
	6 SDCM	0.3160	0.3488	0.0134	0.0057	58.6	1/A/B/C/D
6500K	3 SDCM	0.3123	0.3282	0.0067	0.0029	58.6	1
	6 SDCM	0.3123	0.3282	0.0134	0.0057	58.6	1/A/B/C/D

Notes for Table 7:

1. Color binning at $T_{sp}=25^{\circ}\text{C}$ unless otherwise specified
2. Bridgelux maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

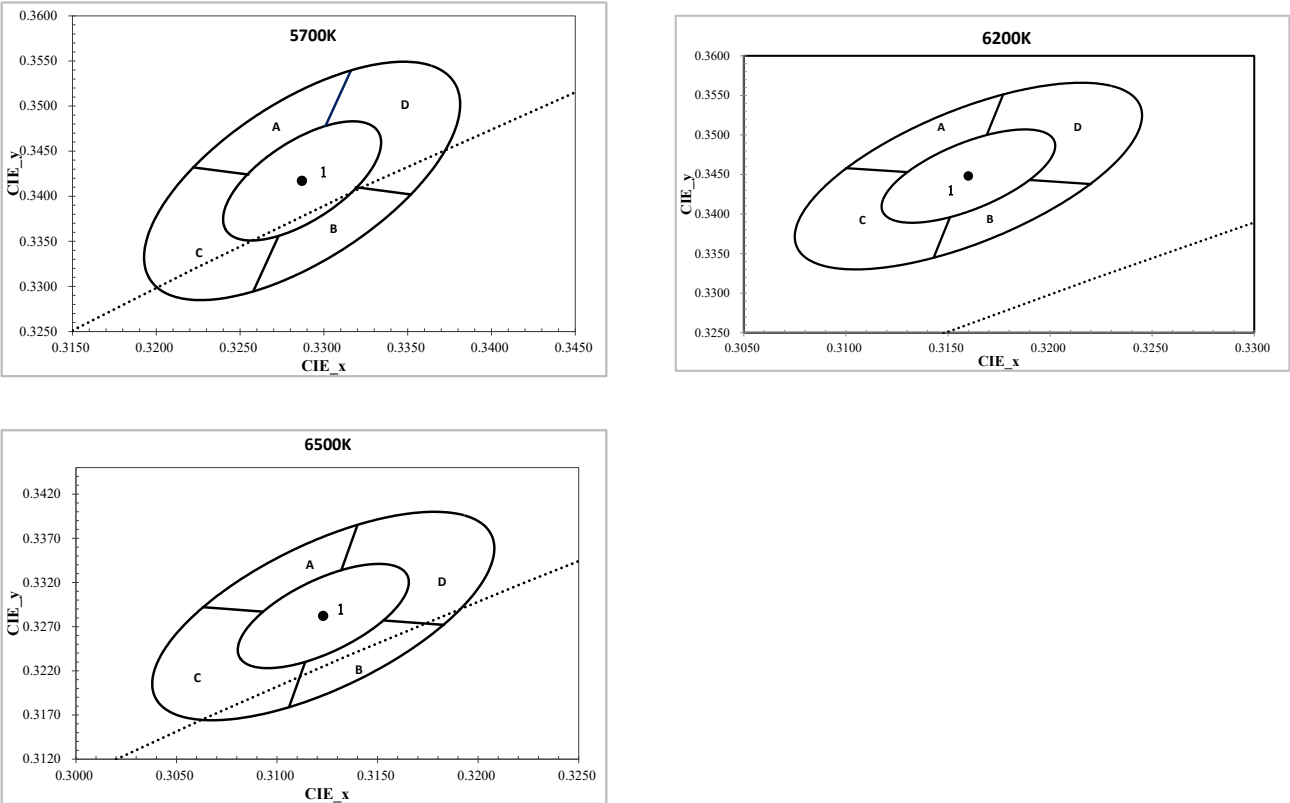
Product Bin Definitions

Figure 1: C.I.E. 1931 Chromaticity Diagram (5 Color Bin Structure, Cold-color Targeted at $T_{sp} = 25^{\circ}\text{C}$)



Product Bin Definitions

Figure 1: C.I.E. 1931 Chromaticity Diagram (5 Color Bin Structure, Cold-color Targeted at $T_{sp}=25^{\circ}\text{C}$)



Performance Curves

Figure 2: Drive Current vs. Forward Voltage ($T_{sp}=25^{\circ}\text{C}$)

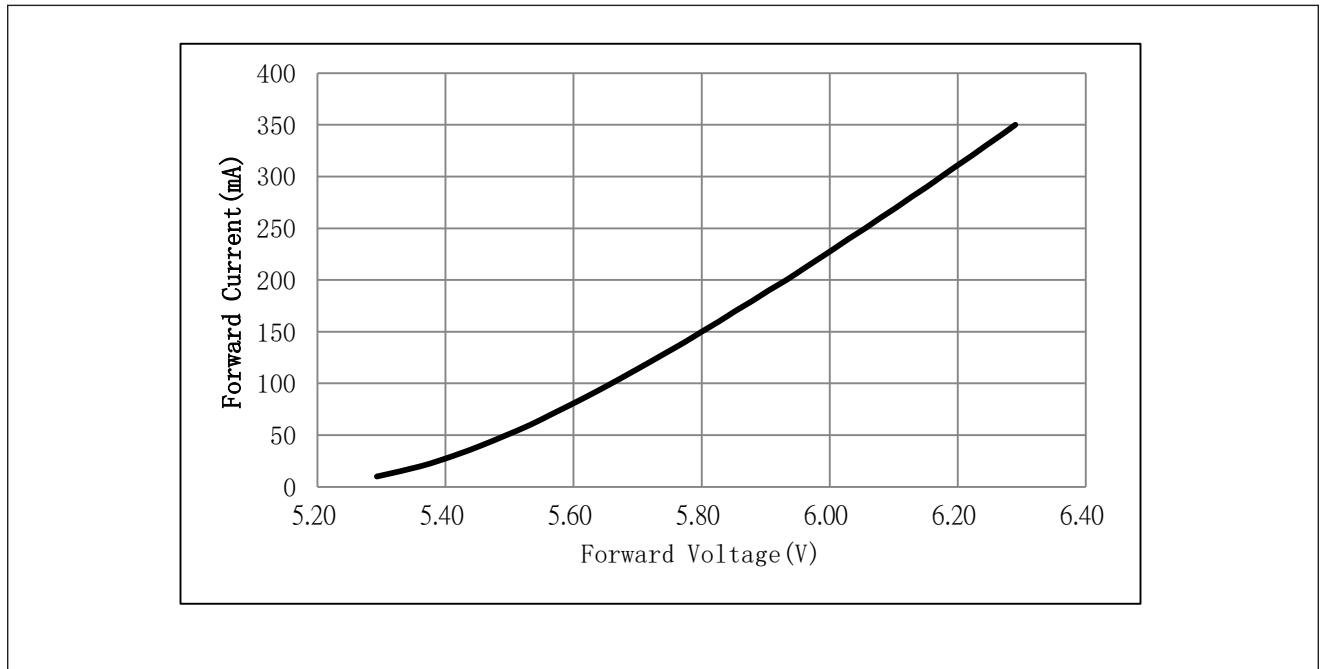
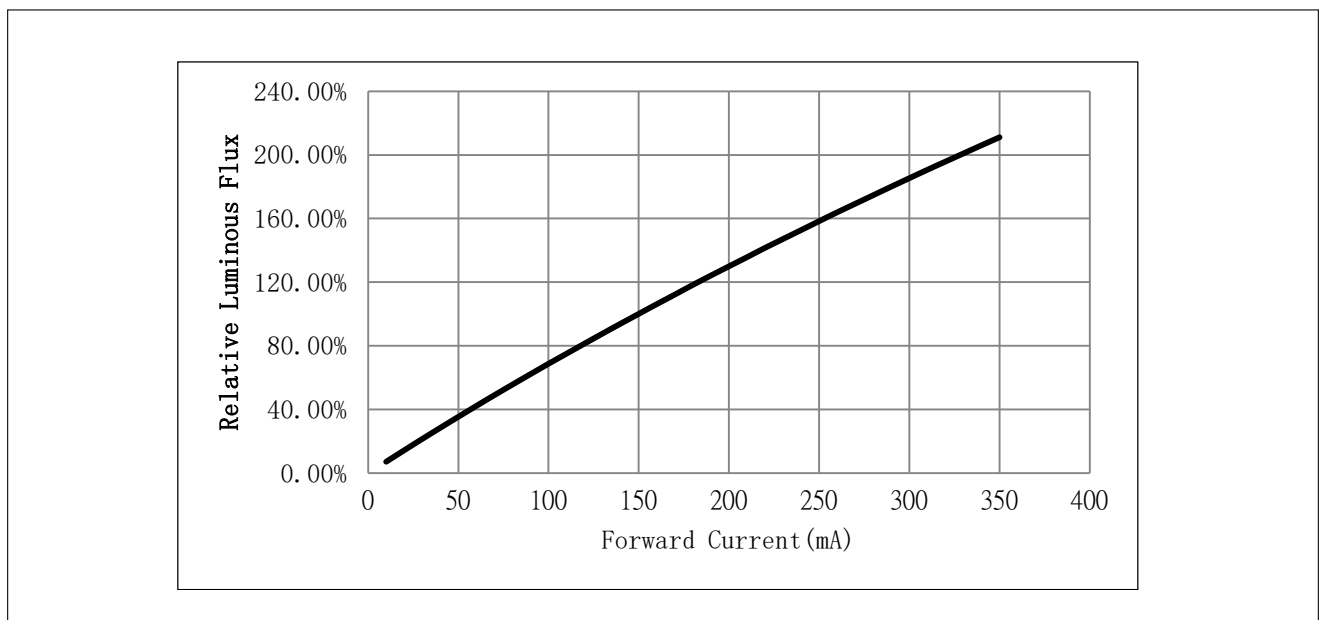


Figure 3: Relative Luminous Flux vs. Forward Current ($T_{sp}=25^{\circ}\text{C}$)



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: Relative Flux vs. Solder Point Temperature

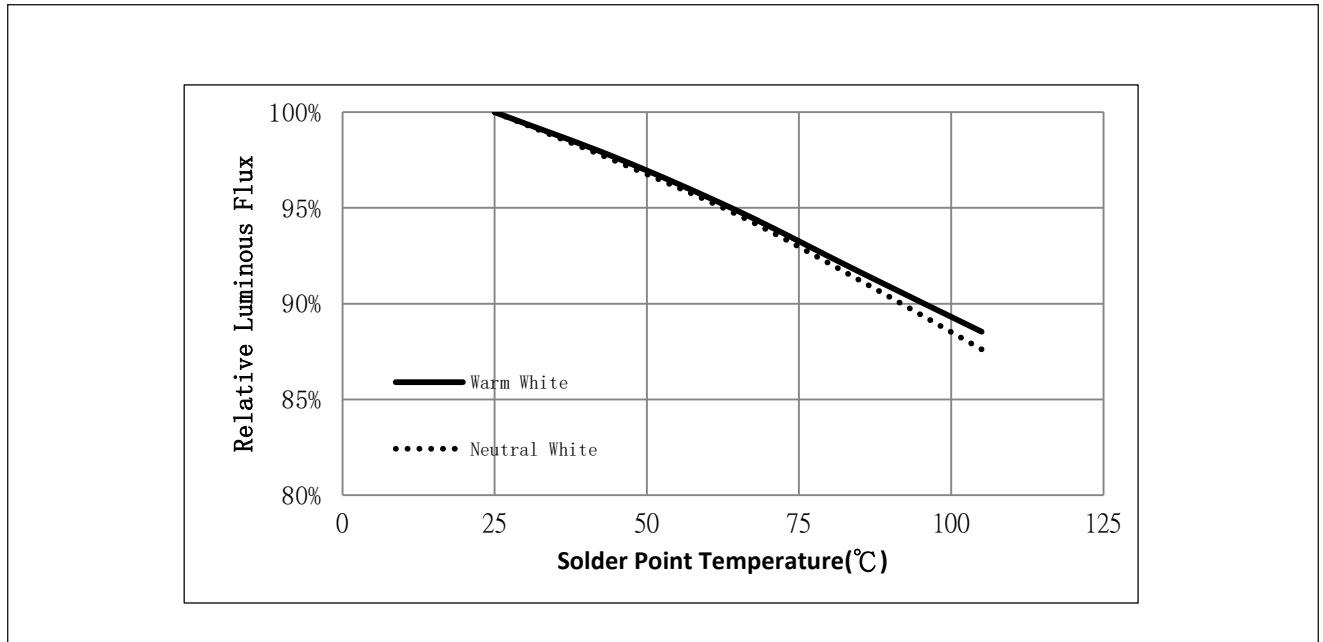
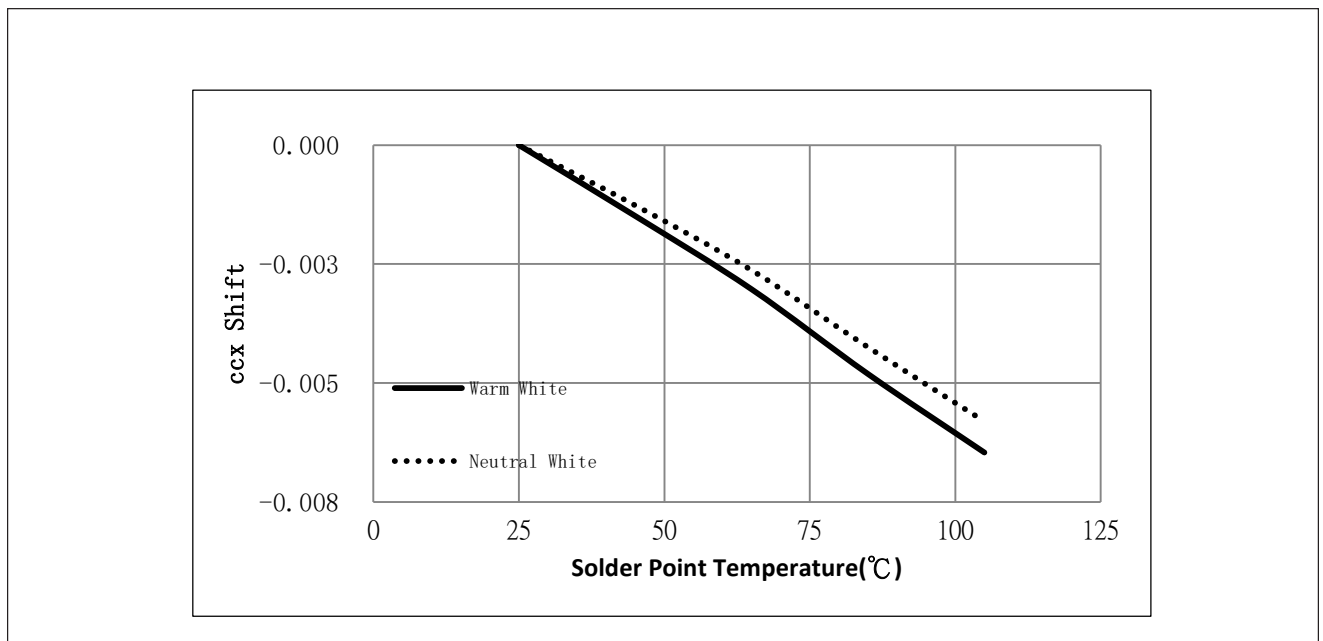


Figure 5: Typical ccx Shift vs. Solder Point Temperature

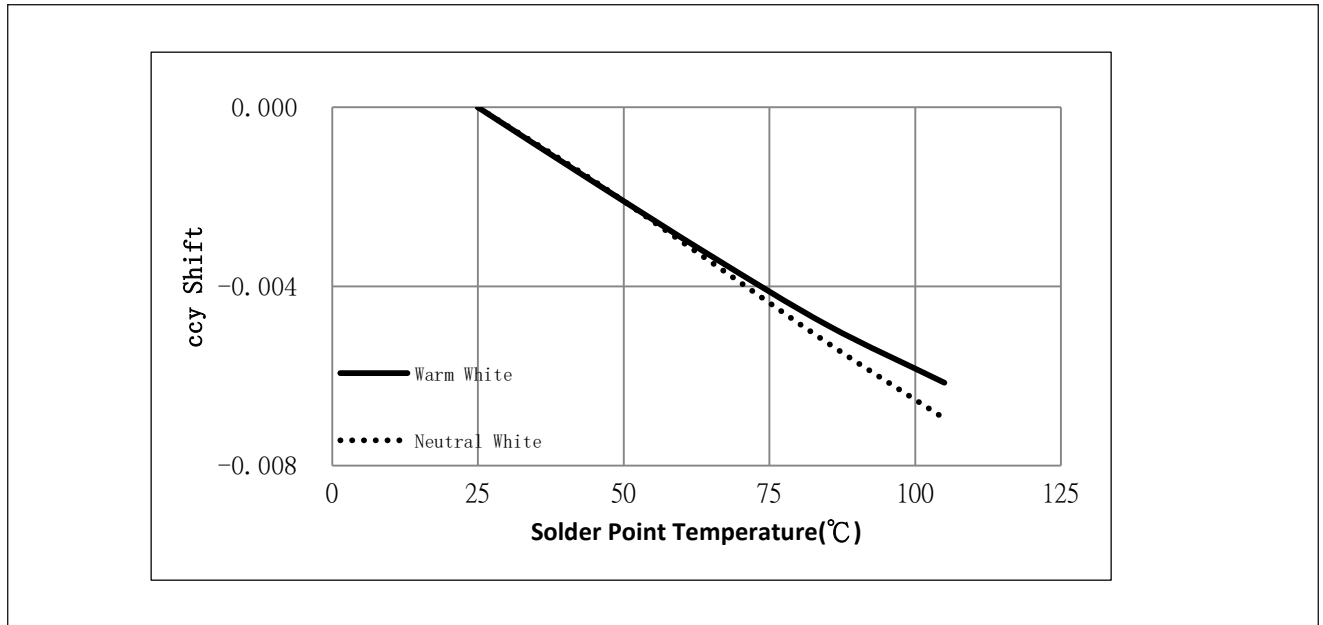


Notes for Figures 4 & 5:

1. Characteristics shown for warm white based on 3000K and 70 CRI.
2. Characteristics shown for neutral white based on 4000K and 70 CRI.
3. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information

Performance Curves

Figure 6: Typical ccy Shift vs. Solder Point Temperature

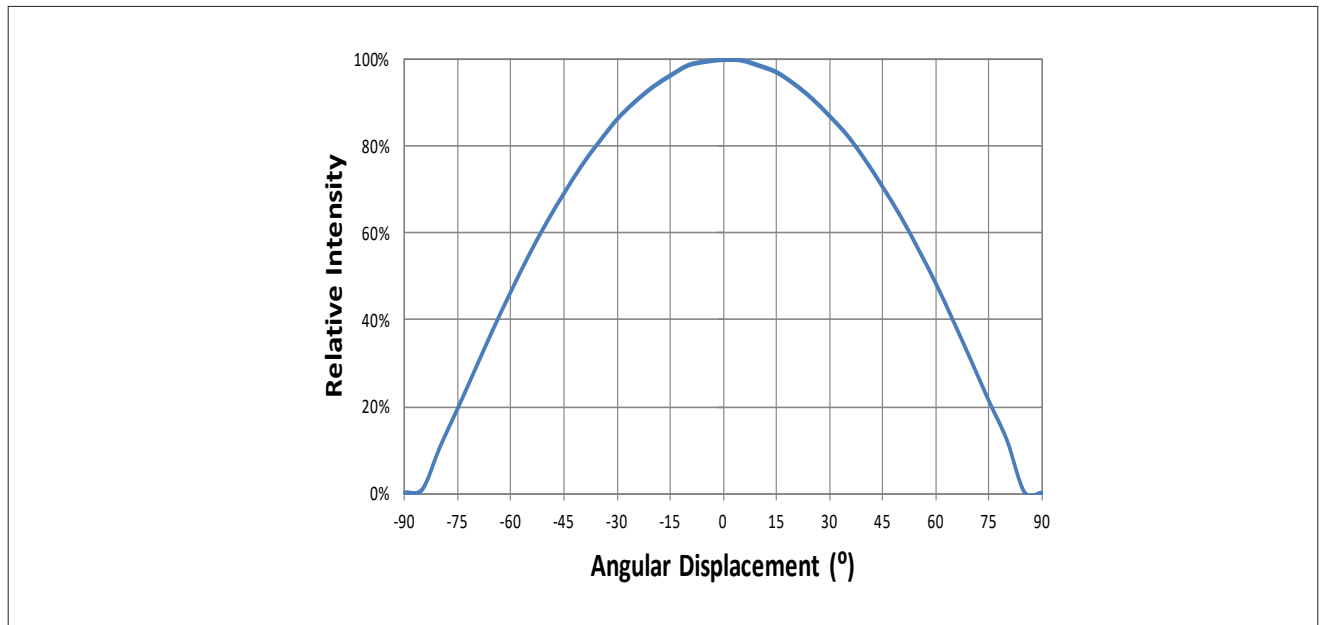


Notes for Figure 6:

1. Characteristics shown for warm white based on 3000K and 70 CRI.
2. Characteristics shown for neutral white based on 4000K and 70 CRI.
3. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information.

Typical Radiation Pattern

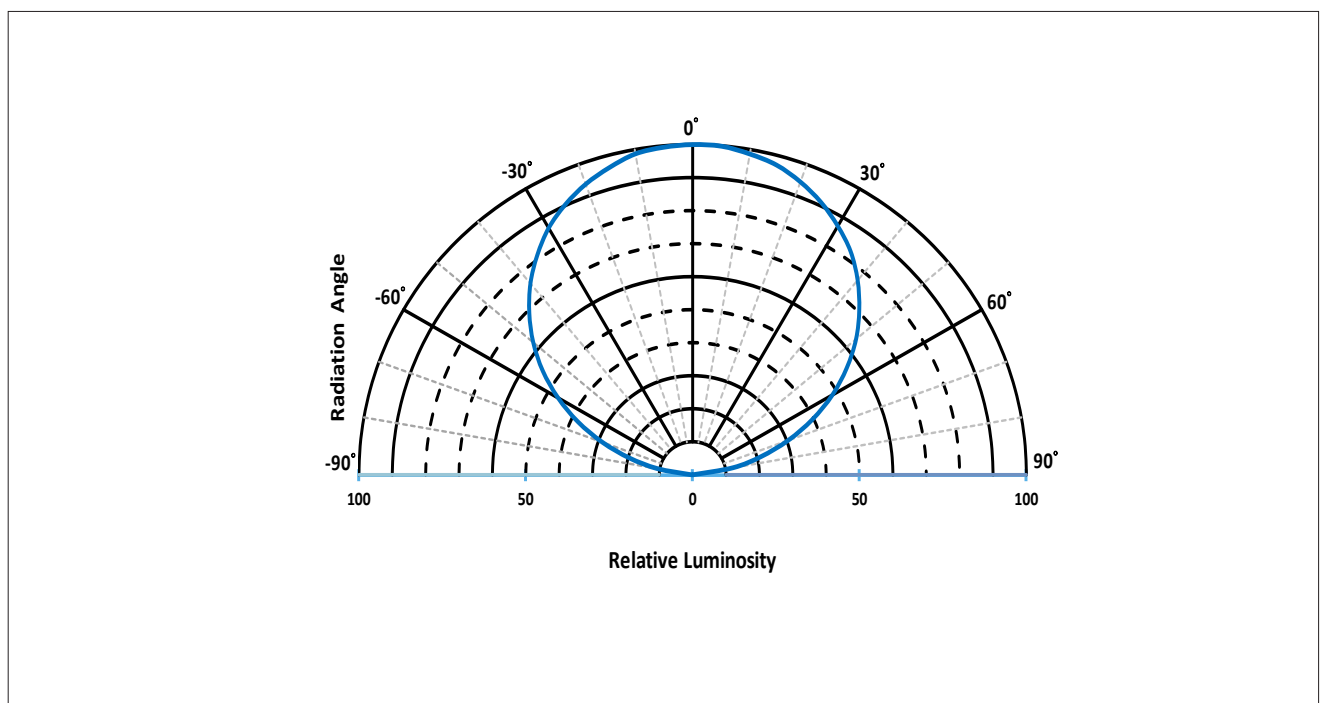
Figure 7: Typical Spatial Radiation Pattern at 150mA, $T_{sp}=25^{\circ}\text{C}$



Notes for Figure 7:

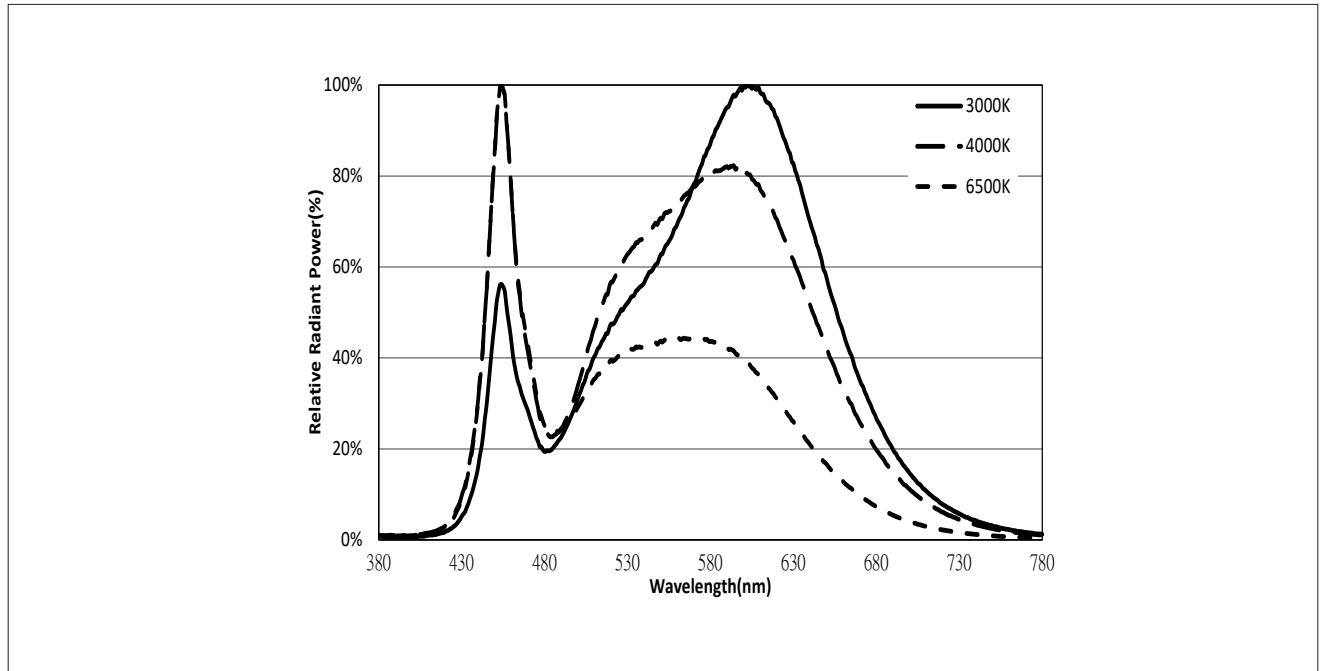
1. Typical viewing angle is 120° .
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (Iv) is $\frac{1}{2}$ of the peak value.

Figure 8: Typical Polar Radiation Pattern at 150mA, $T_{sp}=25^{\circ}\text{C}$



Typical Color Spectrum

Figure 9: Typical Color Spectrum

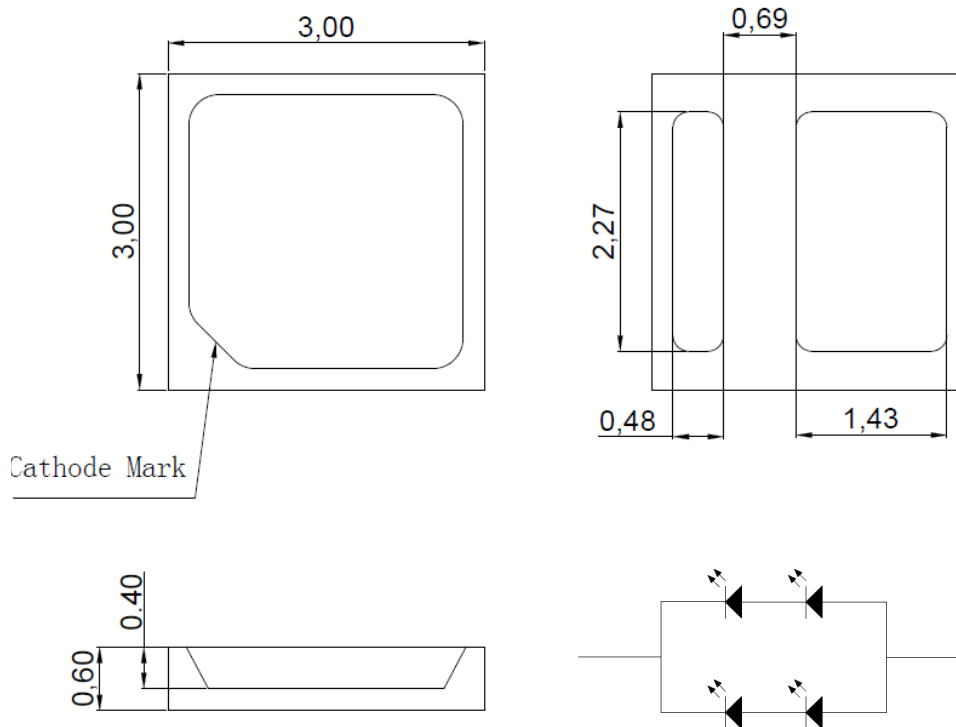


Notes for Figure 9:

1. Color spectra measured at nominal current for $T_{sp} = 25^{\circ}\text{C}$
2. Color spectra shown for 70 CRI products.

Mechanical Dimensions

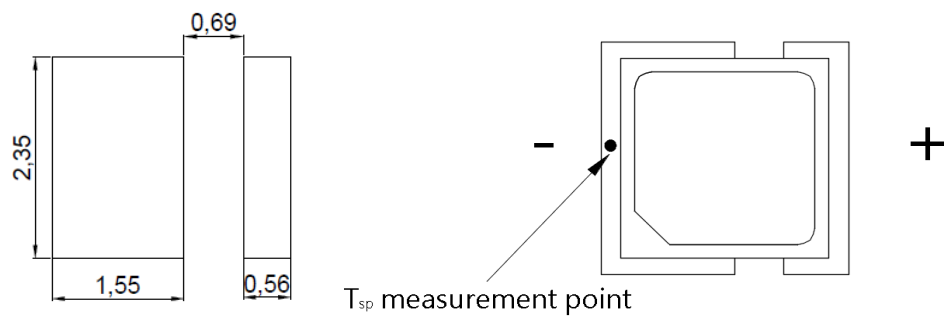
Figure 10: Drawing for SMD 3030



Notes for Figure 10:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are $\pm 0.10\text{mm}$.

Recommended PCB Soldering Pad Pattern



Reliability

Table 8: 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	$T_{\text{slid}} = 260^{\circ}\text{C}$, 10sec, Precondition: 30°C , 60%RH, 168hr	-	3 reflows	0/20
2	Low Temperature Storage	JESD22-A119	$T_{\text{a}} = -40^{\circ}\text{C}$	-	1000 hours	0/20
3	High Temperature Storage	JESD22-A103D	$T_{\text{a}} = 100^{\circ}\text{C}$	-	1000 hours	0/20
4	Low Temperature Operating Life	JESD22-A108D	$T_{\text{a}} = -40^{\circ}\text{C}$	150mA	1000 hours	0/20
5	Temperature Humidity Operating Life	JESD22-A101C	$T_{\text{sp}} = 85^{\circ}\text{C}$, RH=85%	150mA	1000 hours	0/20
6	High Temperature Operating Life	JESD22-A108D	$T_{\text{sp}} = 105^{\circ}\text{C}$	350mA	1000 hours	0/20
7	Thermal Shock	JESD22-A106B	$T_{\text{a}} = -40^{\circ}\text{C} \sim 100^{\circ}\text{C}$; Dwell: 15min; Transfer: 10sec	-	200 cycles	0/20
8	Temperature Cycle	JESD22-A104E	$T_{\text{a}} = -40^{\circ}\text{C} \sim 100^{\circ}\text{C}$; Dwell at extreme temperature: 15min; Ramp rate $< 105^{\circ}\text{C}/\text{min}$	-	200 cycles	0/20
9	Electrostatic Discharge	JS-001-2012	HBM, 2kV, 15k Ω , 100pF, Alternately positive or negative	-	-	0/20

Passing Criteria

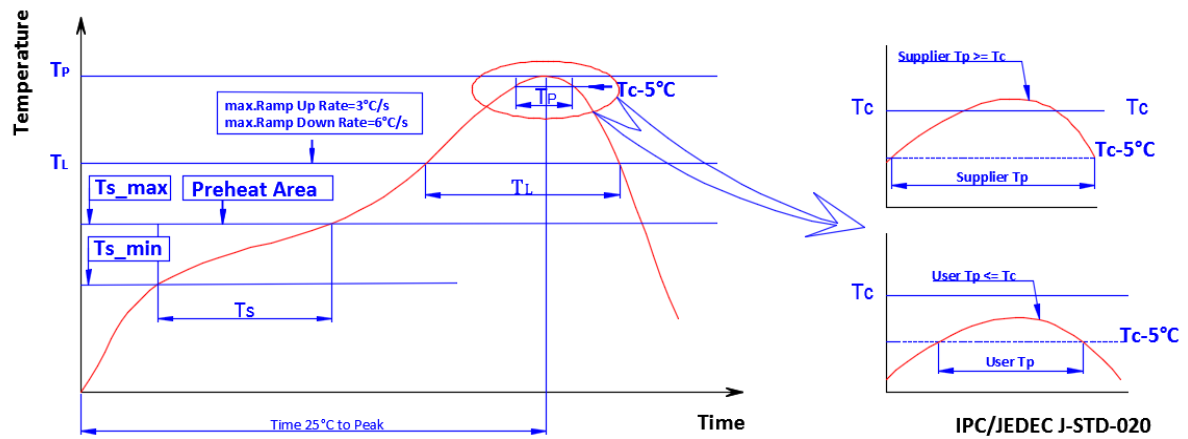
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	150mA	$\Delta V_f < 10\%$
Luminous Flux	Fv	150mA	$\Delta F_v < 30\%$
Chromaticity Coordinates	(x, y)	150mA	$\Delta u'v' < 0.007$

Notes for Table 8:

- Measurements are performed after allowing the LEDs to return to room temperature
- T_{slid} : reflow soldering temperature; T_{a} : ambient temperature

Reflow Characteristics

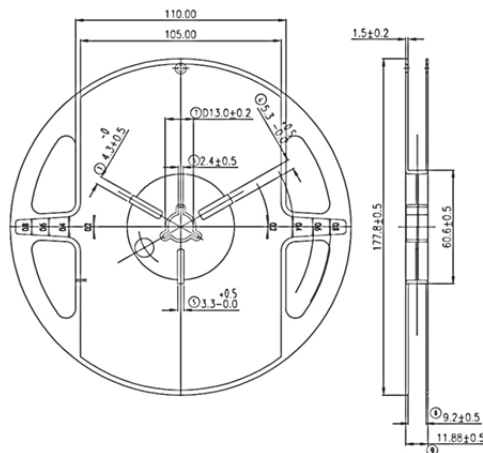
Figure 11 : Reflow Profile



Profile Feature	Lead Free Assembly
Temperature Min. (T_{s_min})	160°C
Temperature Max. (T_{s_max})	205°C
Time (ts) from T_{s_min} to T_{s_max}	60-150 seconds
Ramp-Up Rate (TL to T_p)	3 °C/second
Liquidus Temperature (TL)	220 °C
Time (TL) Maintained Above TL	60-150 seconds
Peak Temp(T_p)	260 °C max.
Time (T_p) Within 5 °C of the Specified Classification Temperature (T_c)	25 seconds max.
Ramp-Down Rate (T_p to TL)	5 °C/second max.
Time 25 °C to Peak Temperature	10 minutes max.

Packaging

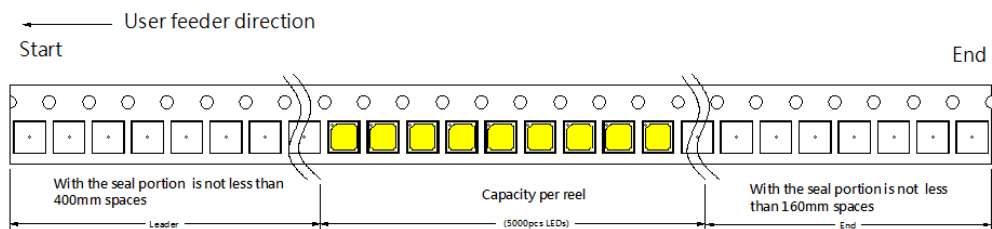
Figure 12: Emitter Reel Drawings



Note for Figure 12:

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

Figure 13: Emitter Tape Drawings

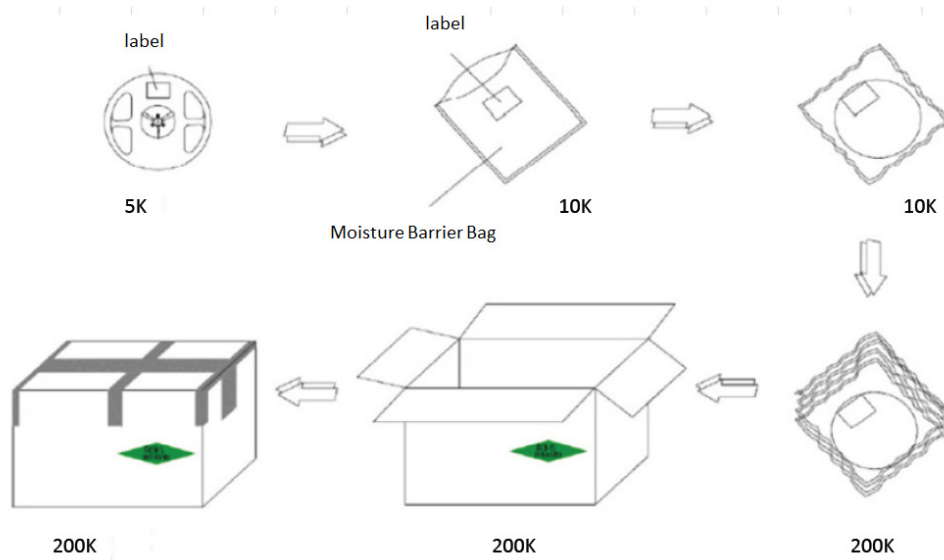


Note for Figure 13:

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

Packaging

Figure 14: Emitter Reel Packaging Drawings



Note for Figure 14:

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 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.

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