

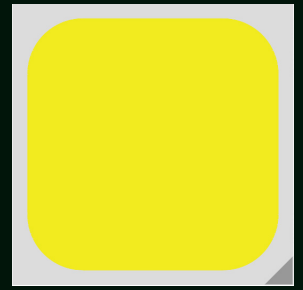


Bridgelux® SMD 5050 2W 6V

Product Data Sheet DS2503

Introduction

SMD 5050



Bridgelux flip chip SMD 5050 is hot-color targeted, which ensures that the LEDs fall within their specified color bin at the typical application conditions of 85°C. Flip chip solution delivers high efficacy and high reliability performance, plus with its broad lumen coverage and wide range of CCT and CRI 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 with 6 V configuration
- Hot-color targeting ensures that color is within the bin at the typical application condition of 85°C
- 3- and 5-step MacAdam ellipse options
- RoHS compliant and lead free
- Multiple CCT and CRI configurations for a wide range of lighting applications

Benefits

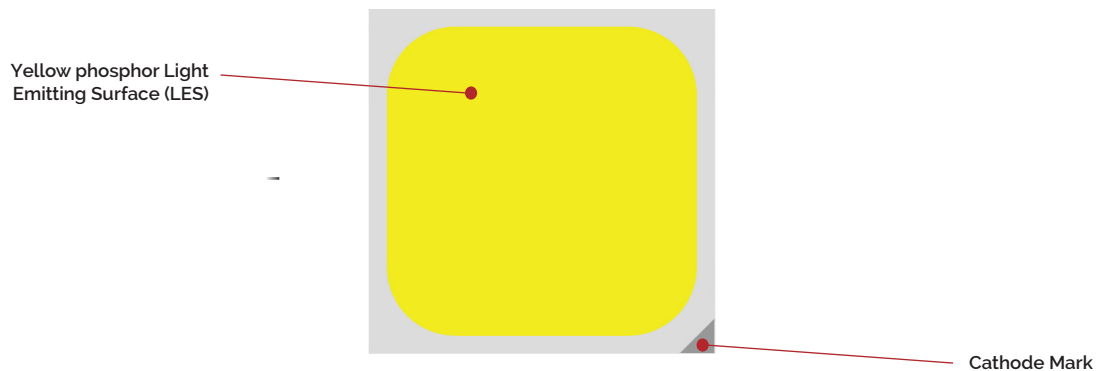
- Lower operating and manufacturing cost
- Ease of design and rapid go-to-market
- Uniform consistent white light
- Compliant with environmental standards
- Design flexibility

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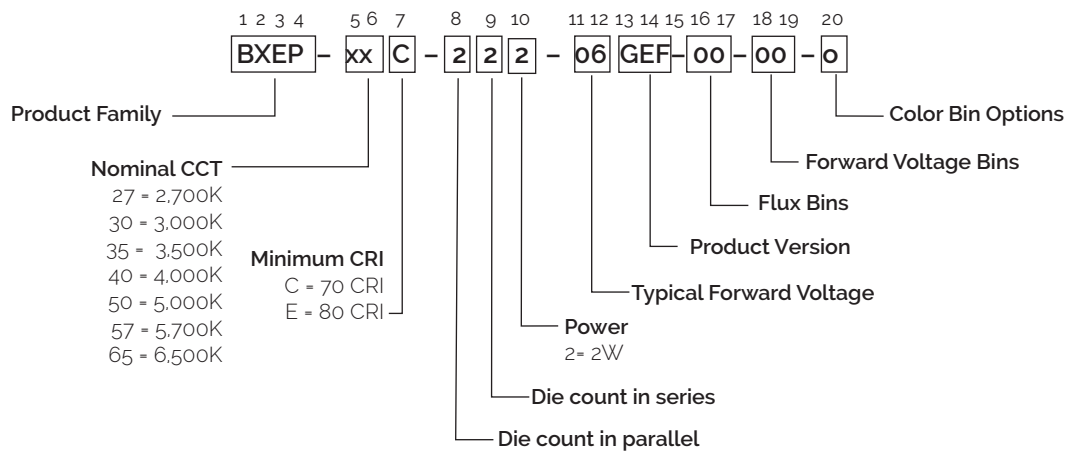
Product Feature Map

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 5050 is explained as follows:



Product Selection Guide

The following product configurations are available:

Table 1: Selection Guide, Pulsed Measurement Data at 350mA ($T_j = T_{sp} = 25^\circ\text{C}$)

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			
BXEP-22C-222-06GEF-00-00-0	2200	70	350	5.40	5.61	5.80	382	2.0	195
BXEP-27C-222-06GEF-00-00-0	2700	70	350	5.40	5.61	5.80	405	2.0	206
BXEP-30C-222-06GEF-00-00-0	3000	70	350	5.40	5.61	5.80	419	2.0	213
BXEP-35C-222-06GEF-00-00-0	3500	70	350	5.40	5.61	5.80	435	2.0	222
BXEP-40C-222-06GEF-00-00-0	4000	70	350	5.40	5.61	5.80	451	2.0	230
BXEP-50C-222-06GEF-00-00-0	5000	70	350	5.40	5.61	5.80	451	2.0	230
BXEP-57C-222-06GEF-00-00-0	5700	70	350	5.40	5.61	5.80	451	2.0	230
BXEP-65C-222-06GEF-00-00-0	6500	70	350	5.40	5.61	5.80	440	2.0	224
BXEP-22E-222-06GEF-00-00-0	2200	80	350	5.40	5.61	5.80	354	2.0	180
BXEP-27E-222-06GEF-00-00-0	2700	80	350	5.40	5.61	5.80	377	2.0	192
BXEP-30E-222-06GEF-00-00-0	3000	80	350	5.40	5.61	5.80	389	2.0	198
BXEP-35E-222-06GEF-00-00-0	3500	80	350	5.40	5.61	5.80	403	2.0	205
BXEP-40E-222-06GEF-00-00-0	4000	80	350	5.40	5.61	5.80	418	2.0	213
BXEP-50E-222-06GEF-00-00-0	5000	80	350	5.40	5.61	5.80	418	2.0	213
BXEP-57E-222-06GEF-00-00-0	5700	80	350	5.40	5.61	5.80	418	2.0	213
BXEP-65E-222-06GEF-00-00-0	6500	80	350	5.40	5.61	5.80	408	2.0	208

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 5 SDCM color.

Example: BXEP-40C-222-06GEF-00-00-0 refers to the full distribution of flux, forward voltage, and color within a 4000K 5-step ANSI standard chromaticity region with a minimum of 70CRI, 2x2 die configuration, 2 W power, 5.64 V typical forward voltage.

2. Product CCT is not targeted at $T_{sp} = 85^\circ\text{C}$. 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 $T_j = T_{sp} = 25^\circ\text{C}$.

5. Bridgelux maintains a $\pm 7.5\%$ tolerance on luminous flux measurements, $\pm 0.1\text{V}$ 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, Pulsed Measurement Data at 350mA ($T_j = T_{sp} = 85^\circ\text{C}$)

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			
BXEP-22C-222-06GEF-00-00-0	2200	70	350	5.20	5.44	5.65	355	1.9	187
BXEP-27C-222-06GEF-00-00-0	2700	70	350	5.20	5.44	5.65	377	1.9	198
BXEP-30C-222-06GEF-00-00-0	3000	70	350	5.20	5.44	5.65	390	1.9	205
BXEP-35C-222-06GEF-00-00-0	3500	70	350	5.20	5.44	5.65	405	1.9	213
BXEP-40C-222-06GEF-00-00-0	4000	70	350	5.20	5.44	5.65	419	1.9	220
BXEP-50C-222-06GEF-00-00-0	5000	70	350	5.20	5.44	5.65	419	1.9	220
BXEP-57C-222-06GEF-00-00-0	5700	70	350	5.20	5.44	5.65	419	1.9	220
BXEP-65C-222-06GEF-00-00-0	6500	70	350	5.20	5.44	5.65	410	1.9	215
BXEP-22E-222-06GEF-00-00-0	2200	80	350	5.20	5.44	5.65	326	1.9	171
BXEP-27E-222-06GEF-00-00-0	2700	80	350	5.20	5.44	5.65	346	1.9	182
BXEP-30E-222-06GEF-00-00-0	3000	80	350	5.20	5.44	5.65	358	1.9	188
BXEP-35E-222-06GEF-00-00-0	3500	80	350	5.20	5.44	5.65	371	1.9	195
BXEP-40E-222-06GEF-00-00-0	4000	80	350	5.20	5.44	5.65	385	1.9	202
BXEP-50E-222-06GEF-00-00-0	5000	80	350	5.20	5.44	5.65	385	1.9	202
BXEP-57E-222-06GEF-00-00-0	5700	80	350	5.20	5.44	5.65	385	1.9	202
BXEP-65E-222-06GEF-00-00-0	6500	80	350	5.20	5.44	5.65	375	1.9	197

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 5 SDCM color.
Example: BXEP-40C-222-06GEF-00-00-0 refers to the full distribution of flux, forward voltage, and color within a 4000K 5-step ANSI standard chromaticity region with a minimum of 70CRI, 2x2 die configuration, 2 W power, 5.64 V typical forward voltage.
2. Product CCT is hot targeted at $T_{sp} = 85^\circ\text{C}$. 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 $T_j = T_{sp} = 85^\circ\text{C}$.
5. Bridgelux maintains a $\pm 7.5\%$ tolerance on luminous flux measurements, $\pm 0.1\text{V}$ 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.

Electrical Characteristics

Table 3: 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, 5} R_{j-sp} (°C/W)
		Minimum	Typical	Maximum		
BXEP-xxC-222-06GEF-00-00-0	350	5.40	5.61	5.80	-2.7	2

Notes for Table 3:

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 5 SDCM color.
Example: BXEP-40C-222-06GEF-00-00-0 refers to the full distribution of flux, forward voltage, and color within a 4000K 5-step ANSI standard chromaticity.
2. Bridgelux maintains a tolerance of $\pm 0.1V$ 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 $T_{sp} = 25^{\circ}C$.
4. Thermal Resistance values based on 4000K 70CRI product.
5. Thermal resistance value was calculated using total electrical input power; optical power was not subtracted from input power.

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 4: Product Performance at Commonly Used Drive Currents

Part Number	CRI	Drive Current ¹ (mA)	Typical V _f T _j = 25°C (V)	Typical Power T _j = 25°C (W)	Typical Flux ² T _j = 25°C (lm)	Typical Pulsed Flux ³ T _j = 85°C (lm)	Typical Efficacy T _j = 25°C (lm/W)
BXEP-22C-222-06GEF-00-00-0	70	100	5.31	0.5	113	105	213
		180	5.42	1.0	201	187	206
		350	5.61	2.0	382	355	194
		500	5.75	2.9	532	495	185
		650	5.89	3.8	678	631	177
		750	5.98	4.5	772	718	172
		900	6.10	5.5	908	845	165
		1050	6.22	6.5	1038	965	159
BXEP-27C-222-06GEF-00-00-0	70	100	5.31	0.5	120	112	227
		180	5.42	1.0	214	199	219
		350	5.61	2.0	405	377	207
		500	5.75	2.9	565	526	197
		650	5.89	3.8	721	670	188
		750	5.98	4.5	820	762	183
		900	6.10	5.5	965	897	176
		1050	6.22	6.5	1102	1025	169
BXEP-30C-222-06GEF-00-00-0	70	100	5.31	0.5	125	116	234
		180	5.42	1.0	221	206	227
		350	5.61	2.0	419	390	214
		500	5.75	2.9	585	544	203
		650	5.89	3.8	745	693	195
		750	5.98	4.5	848	788	189
		900	6.10	5.5	997	928	182
		1050	6.22	6.5	1140	1060	174
BXEP-35C-222-06GEF-00-00-0	70	100	5.31	0.5	129	120	243
		180	5.42	1.0	230	214	235
		350	5.61	2.0	435	405	222
		500	5.75	2.9	607	564	211
		650	5.89	3.8	773	719	202
		750	5.98	4.5	880	818	196
		900	6.10	5.5	1035	963	189
		1050	6.22	6.5	1183	1100	181
BXEP-40C-222-06GEF-00-00-0	70	100	5.31	0.5	134	125	252
		180	5.42	1.0	238	221	244
		350	5.61	2.0	451	419	230
		500	5.75	2.9	629	585	219
		650	5.89	3.8	802	746	209
		750	5.98	4.5	912	848	203
		900	6.10	5.5	1073	998	195
		1050	6.22	6.5	1226	1140	188

Notes for Table 4:

1. Alternate drive currents in Table 4 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a ± 7% tolerance on flux measurements.
3. Typical Pulsed performance values are provided as reference only and are not a guarantee of performance.

Performance at Commonly Used Drive Currents

Table 4: Product Performance at Commonly Used Drive Currents

Part Numbex	CRI	Drive Current ¹ (mA)	Typical V _f T _j = 25°C (V)	Typical Power T _j = 25°C (W)	Typical Flux ² T _j = 25°C (lm)	Typical Pulsed Flux ³ T _j = 85°C (lm)	Typical Efficacy T _j = 25°C (lm/W)
BXEP-50C-222-06GEF-00-00-0	70	100	5.31	0.5	134	125	252
		180	5.42	1.0	238	221	244
		350	5.61	2.0	451	419	230
		500	5.75	2.9	629	585	219
		650	5.89	3.8	802	746	209
		750	5.98	4.5	912	848	203
		900	6.10	5.5	1073	998	195
		1050	6.22	6.5	1226	1140	188
BXEP-57C-222-06GEF-00-00-0	70	100	5.31	0.5	134	125	252
		180	5.42	1.0	238	221	244
		350	5.61	2.0	451	419	230
		500	5.75	2.9	629	585	219
		650	5.89	3.8	802	746	209
		750	5.98	4.5	912	848	203
		900	6.10	5.5	1073	998	195
		1050	6.22	6.5	1226	1140	188
BXEP-65C-222-06GEF-00-00-0	70	100	5.31	0.5	131	122	246
		180	5.42	1.0	233	216	238
		350	5.61	2.0	440	410	224
		500	5.75	2.9	614	571	214
		650	5.89	3.8	783	728	204
		750	5.98	4.5	891	828	199
		900	6.10	5.5	1048	975	191
		1050	6.22	6.5	1197	1113	183
BXEP-22E-222-06GEF-00-00-0	80	100	5.31	0.5	105	97	198
		180	5.42	1.0	187	172	192
		350	5.61	2.0	354	326	180
		500	5.75	2.9	494	454	172
		650	5.89	3.8	629	579	164
		750	5.98	4.5	716	659	160
		900	6.10	5.5	843	775	153
		1050	6.22	6.5	963	886	147
BXEP-27E-222-06GEF-00-00-0	80	100	5.31	0.5	112	103	211
		180	5.42	1.0	199	183	204
		350	5.61	2.0	377	346	192
		500	5.75	2.9	525	483	183
		650	5.89	3.8	669	616	175
		750	5.98	4.5	761	701	170
		900	6.10	5.5	896	824	163
		1050	6.22	6.5	1024	942	157
BXEP-30E-222-06GEF-00-00-0	80	100	5.31	0.5	116	106	217
		180	5.42	1.0	205	189	210
		350	5.61	2.0	389	358	198
		500	5.75	2.9	542	499	189
		650	5.89	3.8	691	636	181
		750	5.98	4.5	786	723	175
		900	6.10	5.5	925	851	168
		1050	6.22	6.5	1057	972	162

Notes for Table 4:

1. Alternate drive currents in Table 4 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a ± 7% tolerance on flux measurements.
3. Typical Pulsed performance values are provided as reference only and are not a guarantee of performance.

Performance at Commonly Used Drive Currents

Table 4: Product Performance at Commonly Used Drive Currents

Part Numbox	CRI	Drive Current ¹ (mA)	Typical V _f T _j = 25°C (V)	Typical Power T _j = 25°C (W)	Typical Flux ² T _j = 25°C (lm)	Typical Pulsed Flux ³ T _j = 85°C (lm)	Typical Efficacy T _j = 25°C (lm/W)
BXEP-35E-222-06GEF-00-00-0	80	100	5.31	0.5	120	110	225
		180	5.42	1.0	213	196	218
		350	5.61	2.0	403	371	205
		500	5.75	2.9	562	517	195
		650	5.89	3.8	716	659	187
		750	5.98	4.5	815	750	182
		900	6.10	5.5	959	882	175
		1050	6.22	6.5	1096	1008	168
BXEP-40E-222-06GEF-00-00-0	80	100	5.31	0.5	124	114	234
		180	5.42	1.0	221	203	226
		350	5.61	2.0	418	385	213
		500	5.75	2.9	583	537	203
		650	5.89	3.8	744	684	194
		750	5.98	4.5	846	778	189
		900	6.10	5.5	996	916	181
		1050	6.22	6.5	1137	1046	174
BXEP-50E-222-06GEF-00-00-0	80	100	5.31	0.5	124	114	234
		180	5.42	1.0	221	203	226
		350	5.61	2.0	418	385	213
		500	5.75	2.9	583	537	203
		650	5.89	3.8	744	684	194
		750	5.98	4.5	846	778	189
		900	6.10	5.5	996	916	181
		1050	6.22	6.5	1137	1046	174
BXEP-57E-222-06GEF-00-00-0	80	100	5.31	0.5	124	114	234
		180	5.42	1.0	221	203	226
		350	5.61	2.0	418	385	213
		500	5.75	2.9	583	537	203
		650	5.89	3.8	744	684	194
		750	5.98	4.5	846	778	189
		900	6.10	5.5	996	916	181
		1050	6.22	6.5	1137	1046	174
BXEP-65E-222-06GEF-00-00-0	80	100	5.31	0.5	121	112	228
		180	5.42	1.0	216	198	221
		350	5.61	2.0	408	375	208
		500	5.75	2.9	569	524	198
		650	5.89	3.8	725	667	190
		750	5.98	4.5	825	759	184
		900	6.10	5.5	971	894	177
		1050	6.22	6.5	1110	1021	170

Notes for Table 4:

1. Alternate drive currents in Table 4 are provided for reference only and are not a guarantee of performance.
2. Bridgelux maintains a ± 7% tolerance on flux measurements.
3. Typical Pulsed performance values are provided as reference only and are not a guarantee of performance.

Absolute Maximum Ratings

Table 5: Maximum Ratings

Parameter	Maximum Rating
LED Junction Temperature (T_j)	135°C
Storage Temperature	-40°C to +105°C
Operating Solder Point Temperature (T_{sp})	-40°C to +105°C
Maximum Drive Current ¹	1050 mA
Maximum Peak Pulsed Forward Current ²	1300 mA
Maximum Reverse Voltage ³	-10
Moisture Sensitivity Rating	MSL 3
Electrostatic Discharge	2KV HBM. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Notes for Table 5:

1. Maximum drive current may be limited by the solder point temperature. Please see Figure 7 for further details.
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. 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.

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 350mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
E7	350	370	lm	$I_F=350\text{mA}$
E8	370	390		
E9	390	410		
F6	410	430		
F7	430	450		
F8	450	470		
F9	470	490		

Note for Table 6:

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

Table 7: Forward Voltage Bin Definition at 350mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
BL	5.2	5.4	V	$I_F=350\text{mA}$
BM	5.4	5.6		
BN	5.6	5.8		

Note for Table 7:

1. Bridgelux maintains a tolerance of $\pm 0.1\text{V}$ on forward voltage measurements.

Product Bin Definitions

Table 8: 3- and 5-step MacAdam Ellipse Color Bin Definitions, $T_{sp} = 85^{\circ}\text{C}$

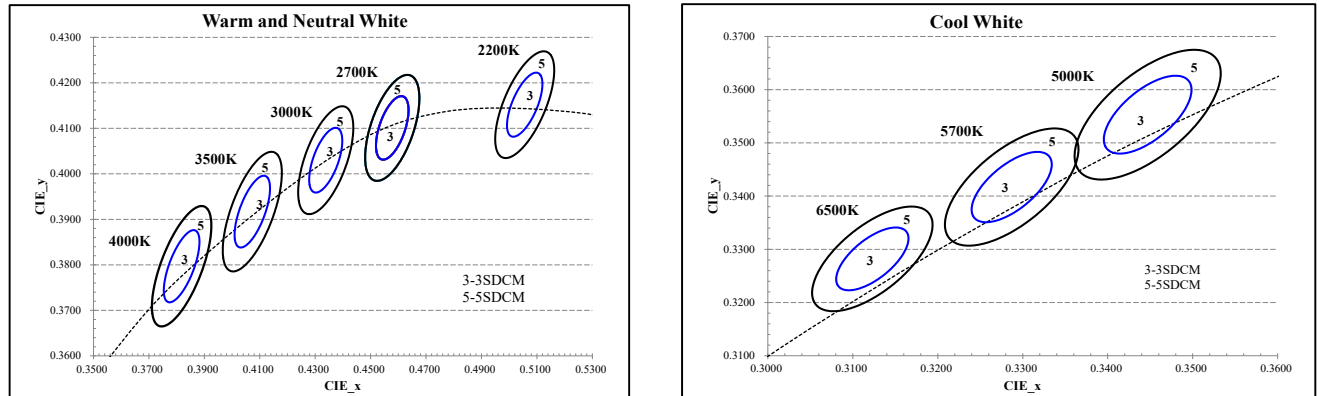
CCT	Color Space	Center Point		Major Axis	Minor Axis	Ellipse Rotation Angle	Color Bin
		X	Y				
2200K	3	0.5056	0.4152	0.00863	0.00398	49.270	3
	5	0.5056	0.4152	0.01438	0.00663	49.270	5
2700K	3	0.4578	0.4101	0.00810	0.00420	53.700	3
	5	0.4578	0.4101	0.01350	0.00700	53.700	5
3000K	3	0.4338	0.4030	0.00834	0.00408	53.220	3
	5	0.4338	0.4030	0.01390	0.00680	53.220	5
3500K	3	0.4073	0.3917	0.00927	0.00414	54.000	3
	5	0.4073	0.3917	0.01545	0.00690	54.000	5
4000K	3	0.3818	0.3797	0.00939	0.00402	53.720	3
	5	0.3818	0.3797	0.01565	0.00670	53.720	5
5000K	3	0.3447	0.3553	0.00822	0.00354	59.620	3
	5	0.3447	0.3553	0.01370	0.00590	59.620	5
5700K	3	0.3287	0.3417	0.00746	0.00320	59.090	3
	5	0.3287	0.3417	0.01243	0.00533	59.090	5
6500K	3	0.3123	0.3282	0.00669	0.00285	58.570	3
	5	0.3123	0.3282	0.01115	0.00475	58.570	5

Notes for Table 8:

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

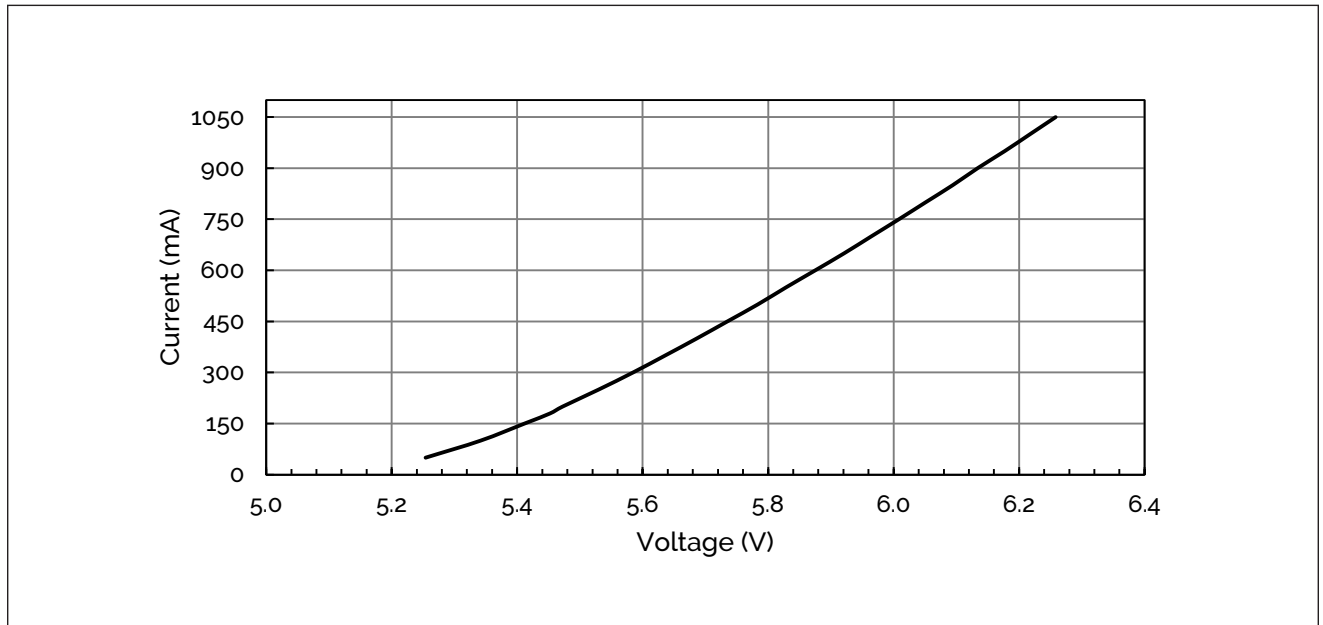
Performance Curves

Figure 1: C.I.E. 1931 Chromaticity Diagram (2 Color Bin Structure, Hot-color Targeted at $T_{sp}=85^{\circ}\text{C}$)



Performance Curves

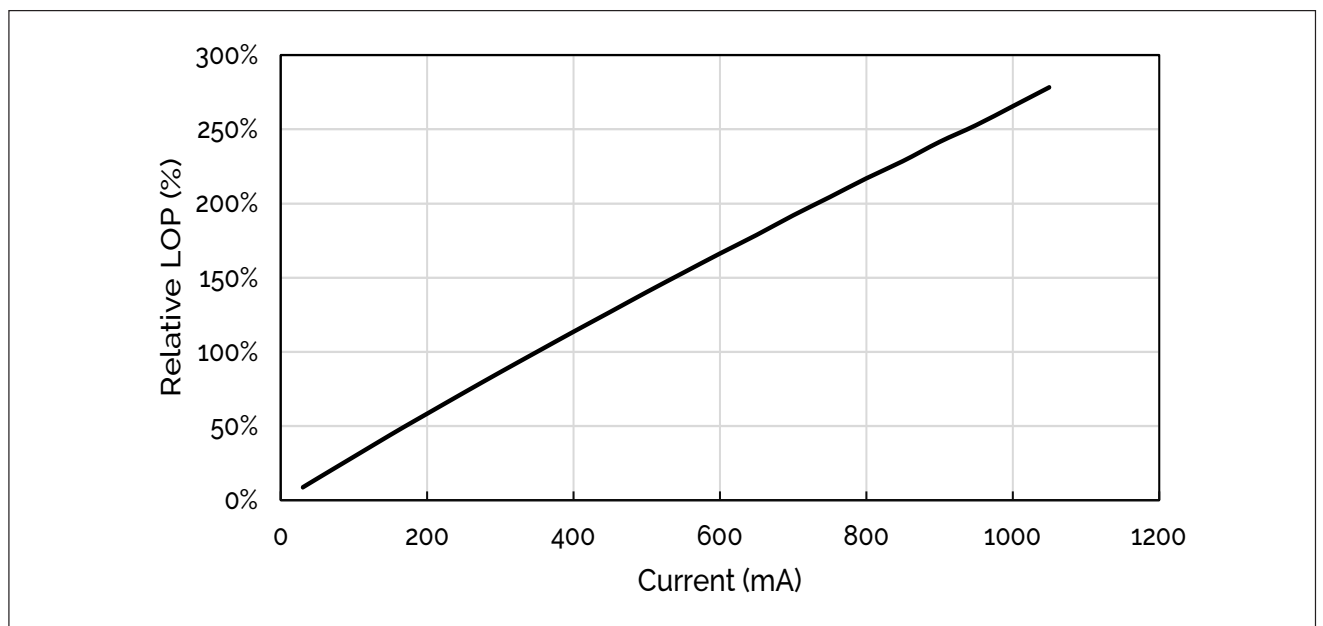
Figure 2: Drive Current vs. Voltage ($T_{sp}=25^{\circ}\text{C}$)



Note for Figure 2:

1. Bridgelux does not recommend driving this LED at low current (<30mA). Doing so may produce unpredictable results. Pulse width modulation (PWM) is recommended for dimming effects.

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



Note for Figure 3:

1. Pulse width modulation (PWM) is recommended for dimming effects.

Performance Curves

Figure 4: Relative DC Flux vs. Solder Point Temperature

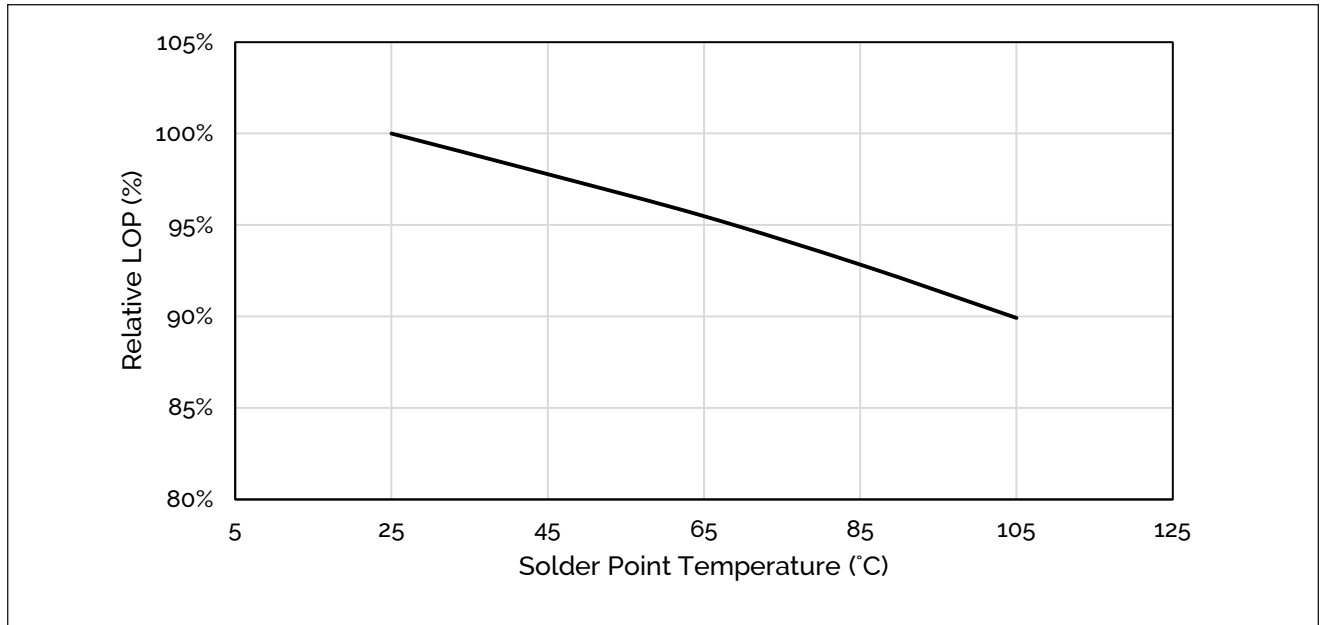
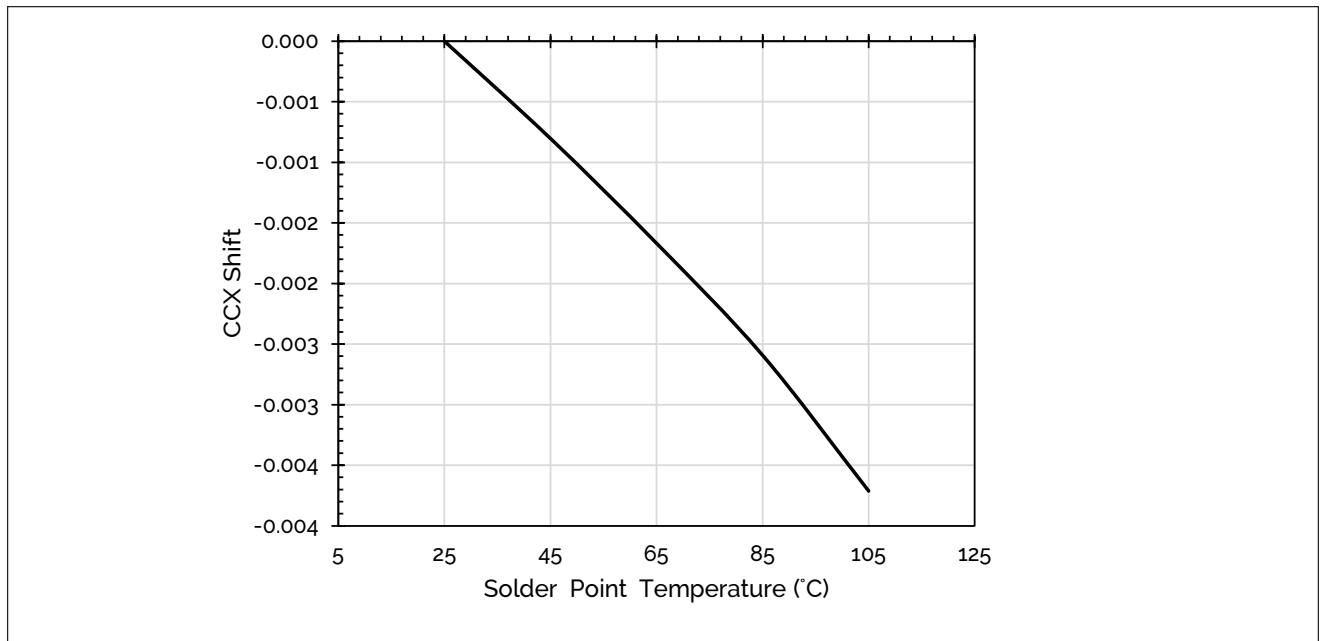


Figure 5: Typical DC ccx Shift vs. Solder Point Temperature

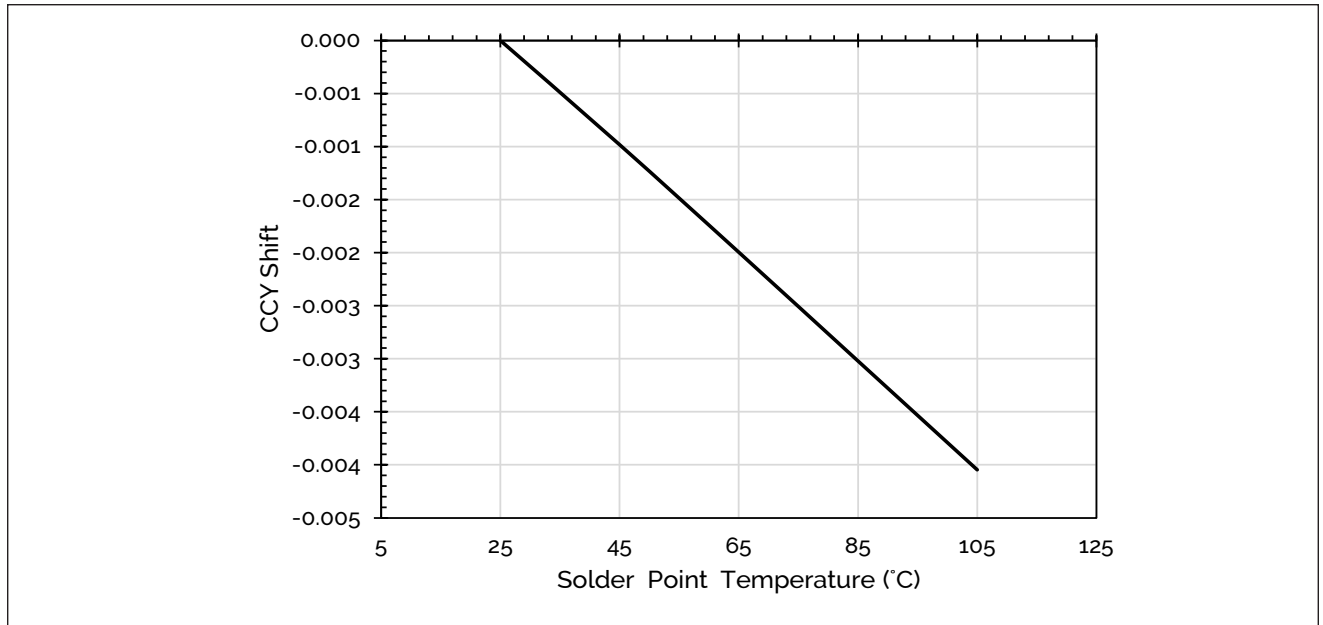


Notes for Figures 4 & 5:

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

Performance Curves

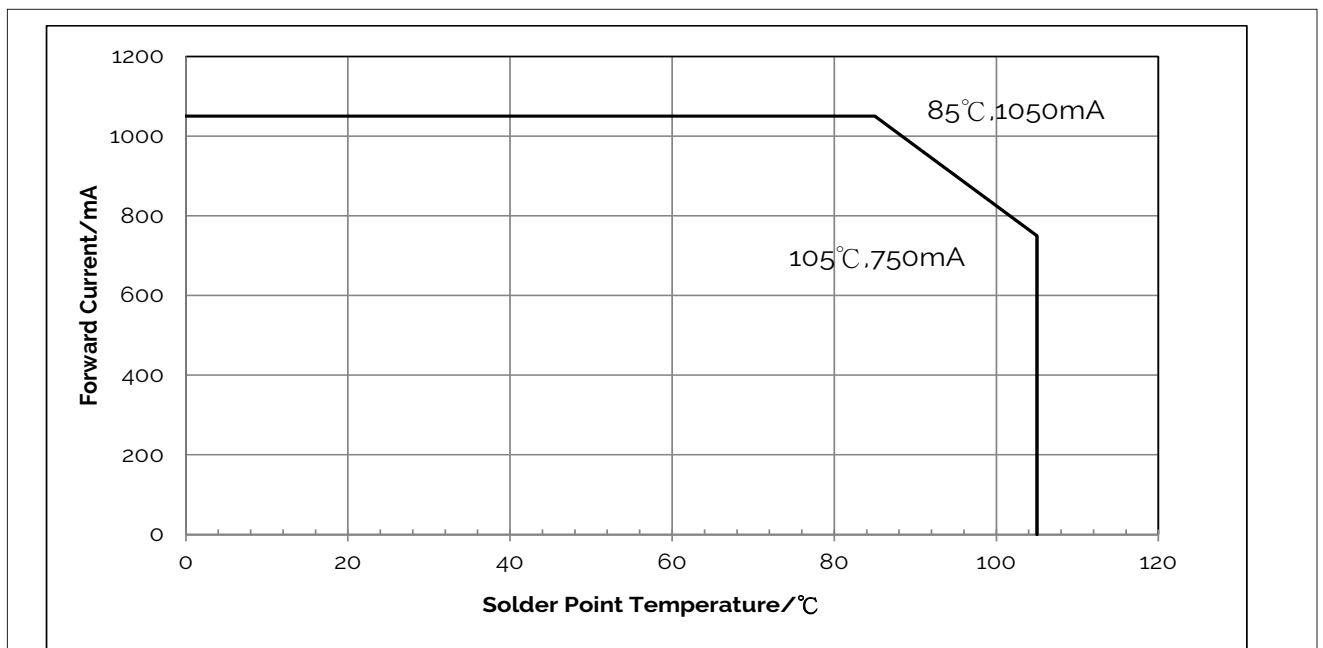
Figure 6: Typical DC ccy Shift vs. Solder Point Temperature



Notes for Figure 6:

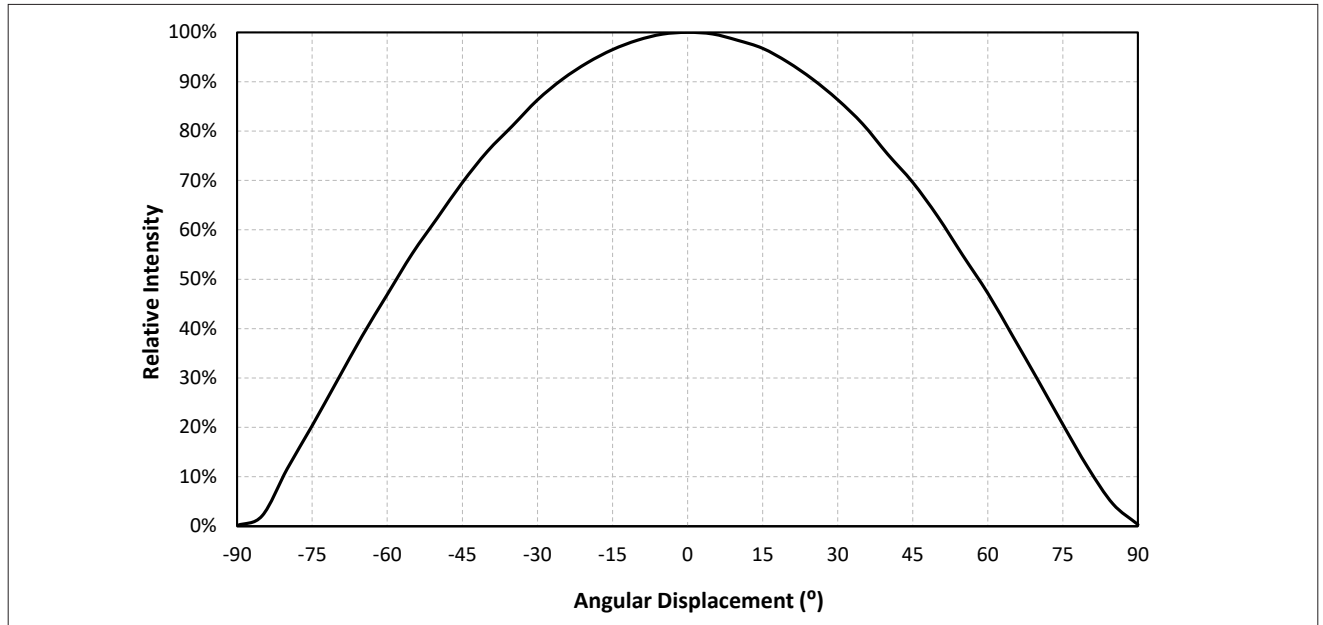
1. Characteristics shown for 4000K and 70 CRI.
2. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information.

Figure 7: Drive Current Derating Curve



Typical Radiation Pattern

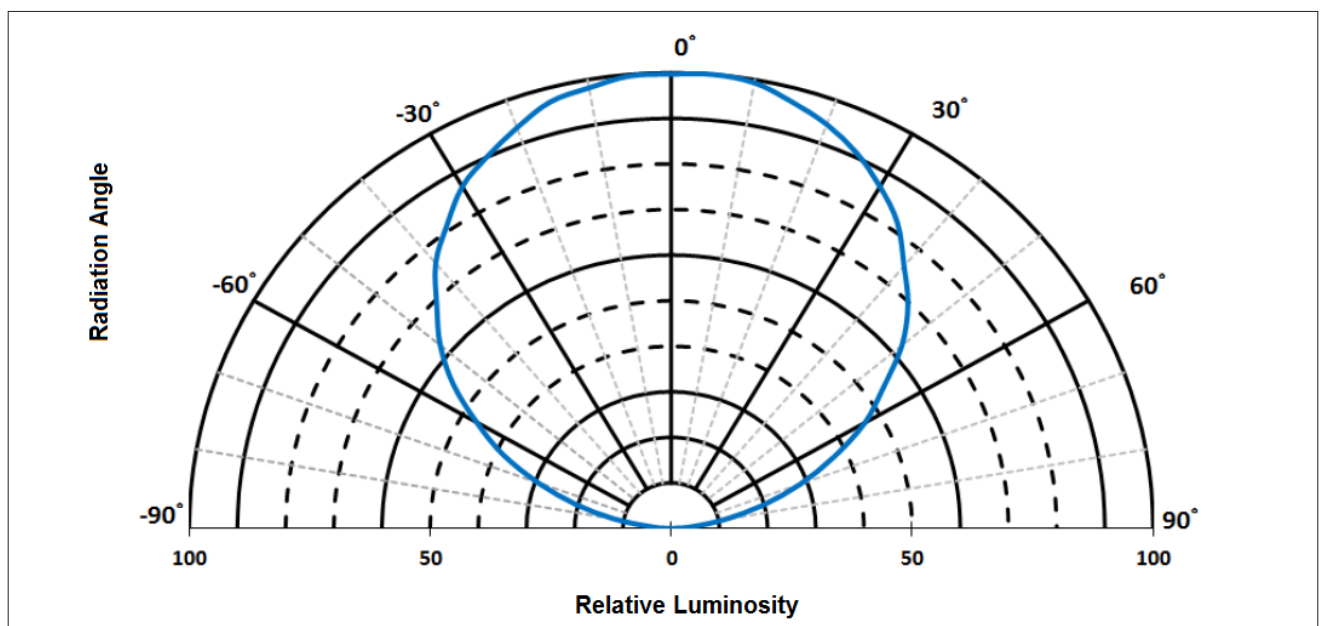
Figure 8: Typical Spatial Radiation Pattern at 350mA, $T_{sp}=25^{\circ}\text{C}$



Notes for Figure 8:

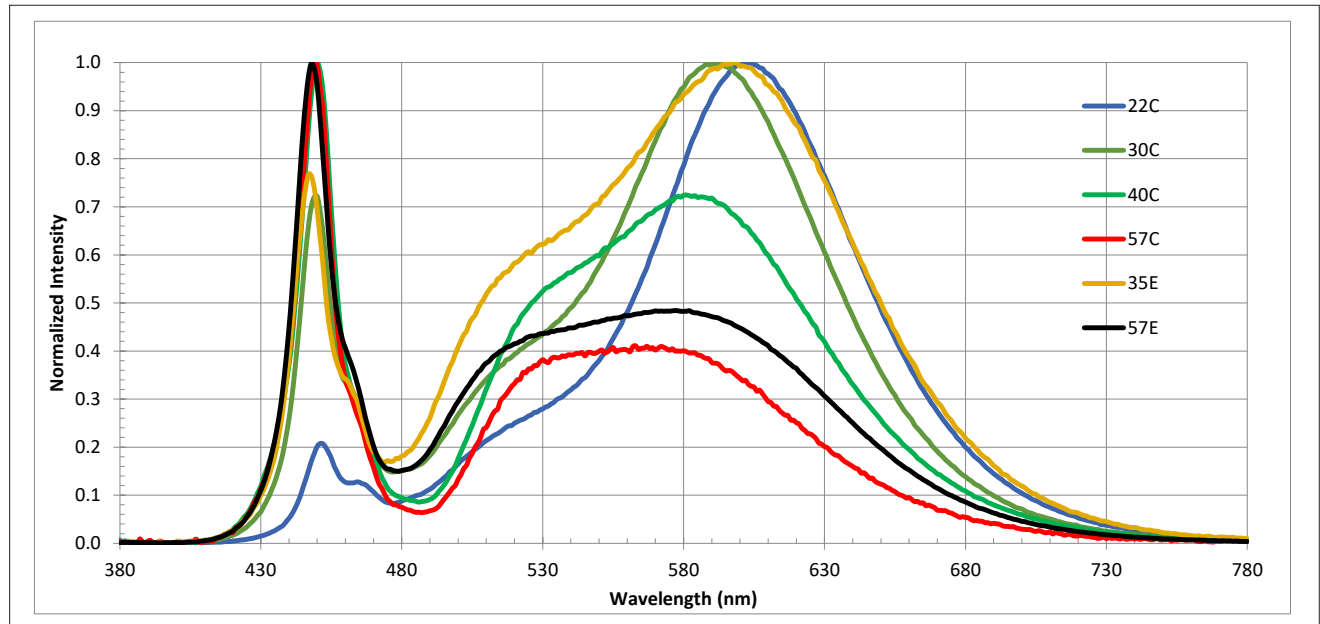
1. Typical viewing angle is 116° .
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (lv) is $\frac{1}{2}$ of the peak value.

Figure 9: Typical Polar Radiation Pattern at 350mA, $T_{sp}=25^{\circ}\text{C}$



Typical Color Spectrum

Figure 10: Typical Color Spectrum

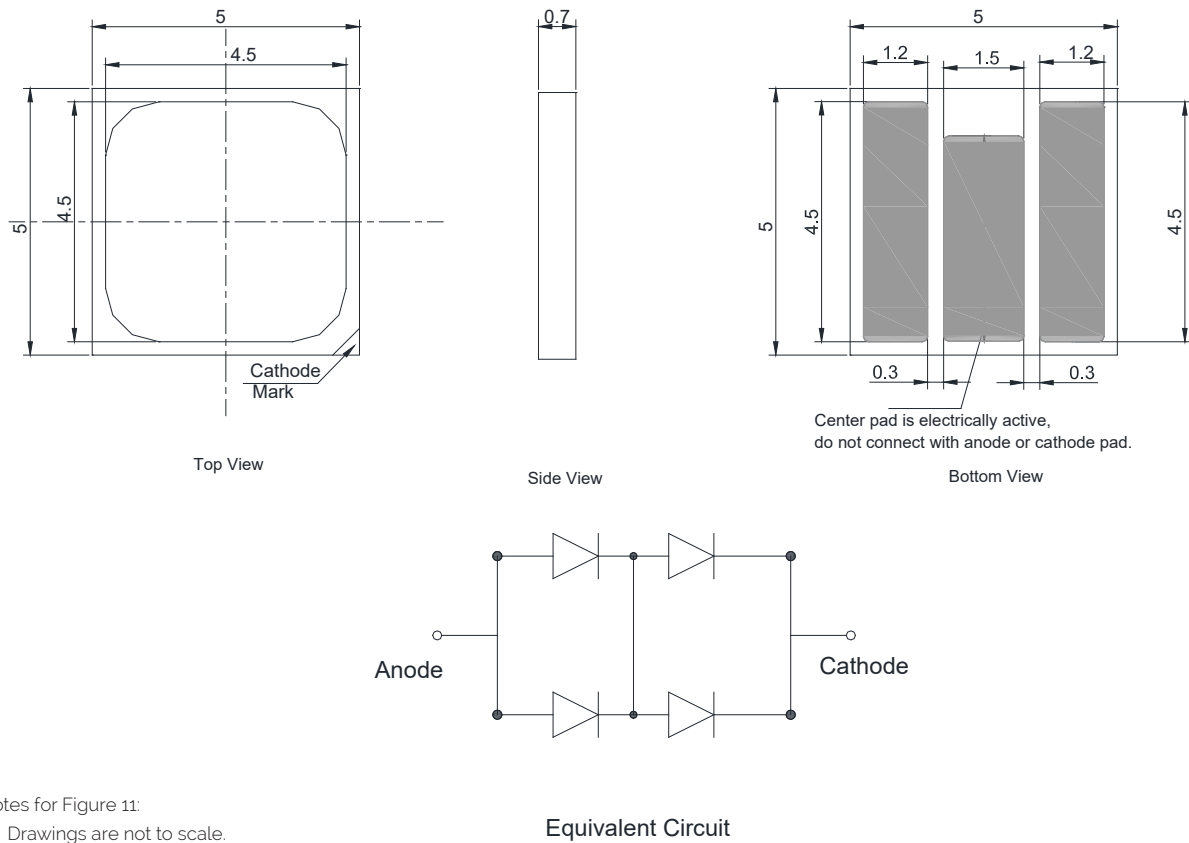


Notes for Figure 10:

1. Color spectra measured at nominal current for $T_{sp} = 25^{\circ}\text{C}$
2. 22C spectra shown for warm white is 2200K and 70 CRI.
3. 30C spectra shown for warm white is 3000K and 70 CRI.
4. 40C spectra shown for neutral white is 4000K and 70 CRI.
5. 57C spectra shown for cool white is 5700K and 70 CRI.
6. 35E spectra shown for warm white is 3500K and 80 CRI.
7. 57E spectra shown for cool white is 5700K and 80 CRI.

Mechanical Dimensions

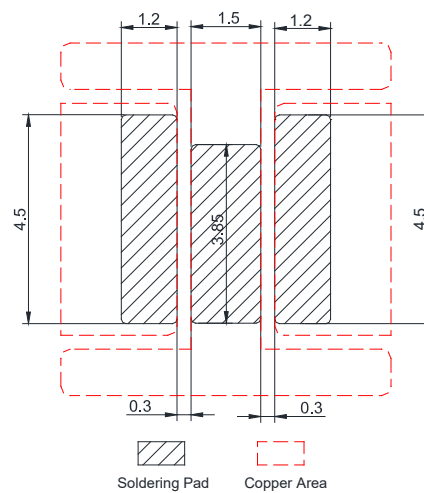
Figure 11: Drawing for SMD 5050



Notes for Figure 11:

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

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	$T_{\text{slid}} = 260^{\circ}\text{C}$, 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	$T_{\text{a}} = 105^{\circ}\text{C}$	-	1000 hours	0/20
4	Low Temperature Operating Life	JESD22-A108D	$T_{\text{a}} = -40^{\circ}\text{C}$	350mA	1000 hours	0/20
5	Temperature Humidity Operating Life	JESD22-A101C	$T_{\text{sp}} = 85^{\circ}\text{C}$, RH-85%	350mA	1000 hours	0/20
6	High Temperature Operating Life	JESD22-A108D	$T_{\text{sp}} = 105^{\circ}\text{C}$	750mA	1000 hours	0/20
7	Thermal Shock	JESD22-A106B	$T_{\text{a}} = -40^{\circ}\text{C} \sim 125^{\circ}\text{C}$; Dwell : 15min; Transfer: 10sec	-	200 cycles	0/20
8	Electrostatic Discharge	JS-001-2012	HBM, 2kV, 15k Ω , 100pF, Alternately positive or negative	-	-	0/20

Passing Criteria

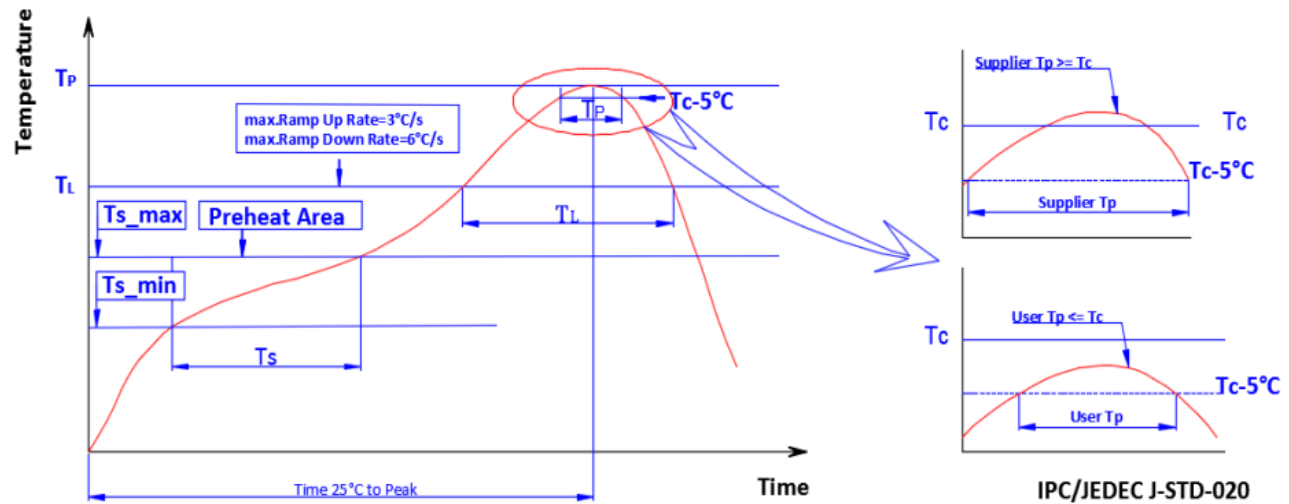
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	350mA	$\Delta V_f < 10\%$
Luminous Flux	Fv	350mA	$\Delta F_v < 30\%$
Chromaticity Coordinates	(x, y)	350mA	$\Delta u'v' < 0.007$

Notes for Table 9:

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

Reflow Characteristics

Figure 12 : Reflow Profile



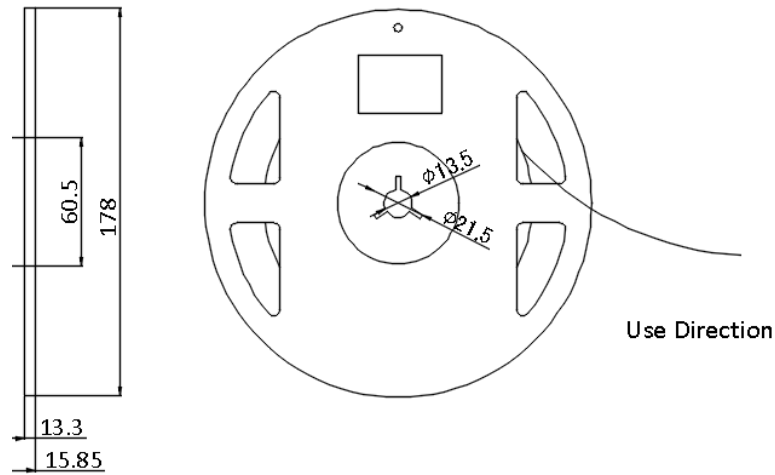
Profile Feature	Lead Free Assembly
Average Ramp-Up Rate (T_s max to T_p)	3/second max.
Preheat: Temperature Min (T_s min)	150
Preheat: Temperature Max (T_s max)	190
Preheat: Time (t_s min to t_s max)	90-120 seconds
Liquidous Temperature (T_L)	217
Time Maintained Above Liquidous Temperature (T_L): Time (t_L)	60-90 seconds
Peak/Classification Temperature (T_p)	240-245°C
Time Within 10 of Actual Peak Temperature (T_p)	20-40 seconds
Ramp-Down Rate	6/second max
Time 25 to Peak Temperature	8 minutes max.

Caution:

1. The maximum number of reflow solderings do not exceed 2 times.
2. Repairs should not be done after the LEDs have been soldered. When repair is unavoidable, suitable tools must be used.

Packaging

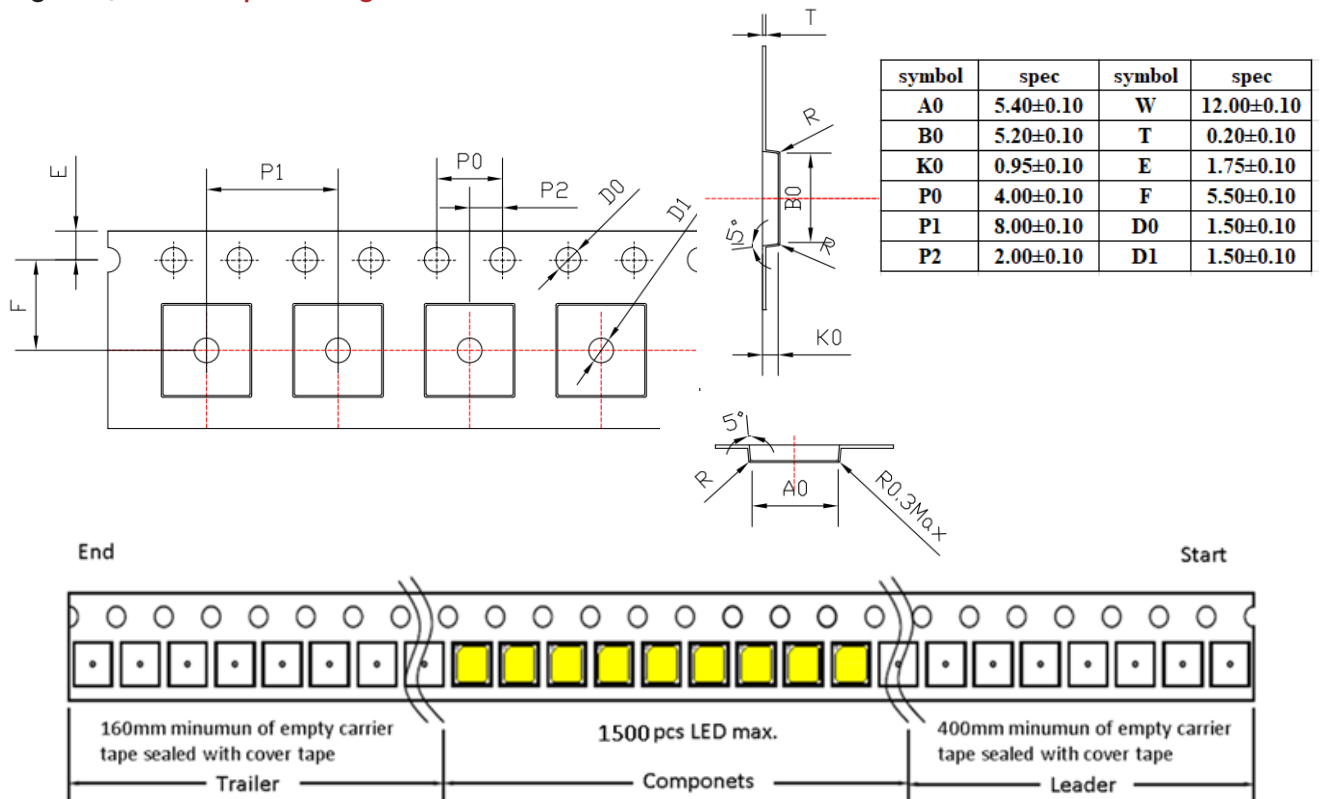
Figure 13: Emitter Reel Drawings



Note for Figure 13:

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

Figure 14: Emitter Tape Drawings

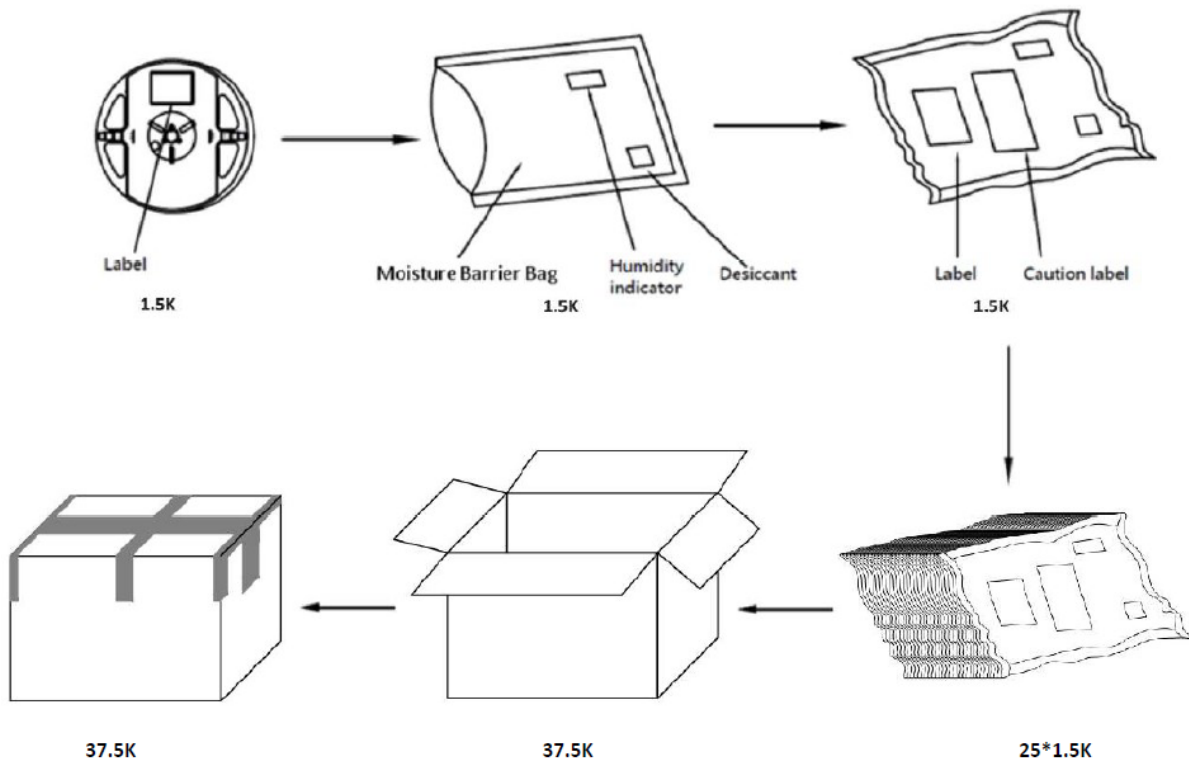


Note for Figure 14:

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

Packaging

Figure 15: Emitter Reel Packaging Drawings



Note for Figure 15:

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: 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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