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Bridgelux® Gen2 SMD 3030 Series

Product Data Sheet DS66

Introduction

SMD 3030



The Bridgelux SMD 3030 offers exceptional performance in a compact LED package. This 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 3030 provides unparalleled design-in flexibility for indoor and outdoor lighting applications. Its high flux capability reduces the number of LEDs and enables industry leading system level lumen per dollar. The SMD 3030 is ideal as a drop in replacement for emitters with an industry standard 3.0mm x 3.0mm footprint.

Features

- Competitive efficacy and lumen per dollar
- Industry-standard 3030 footprint
- Excellent color maintenance
- 9 bin color control enables tight color control
- Superior luminous flux at maximum current for reduced LED count
- 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 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
- Reliable and constant white point
- Environmentally friendly, complies with standards
- Design flexibility

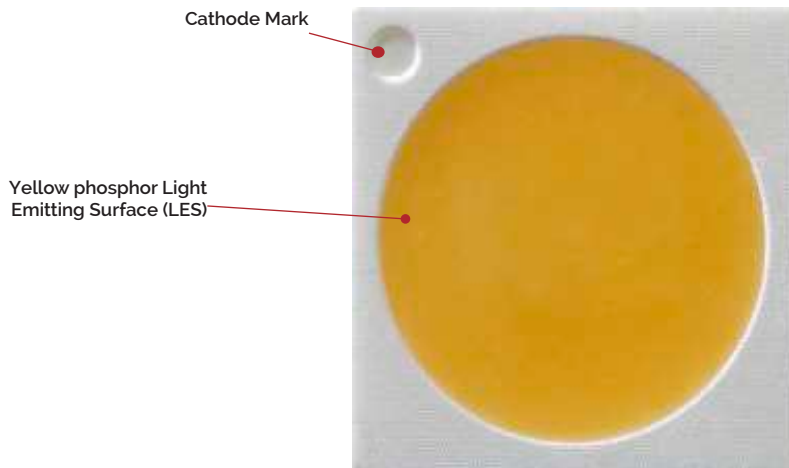
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Product Feature Map

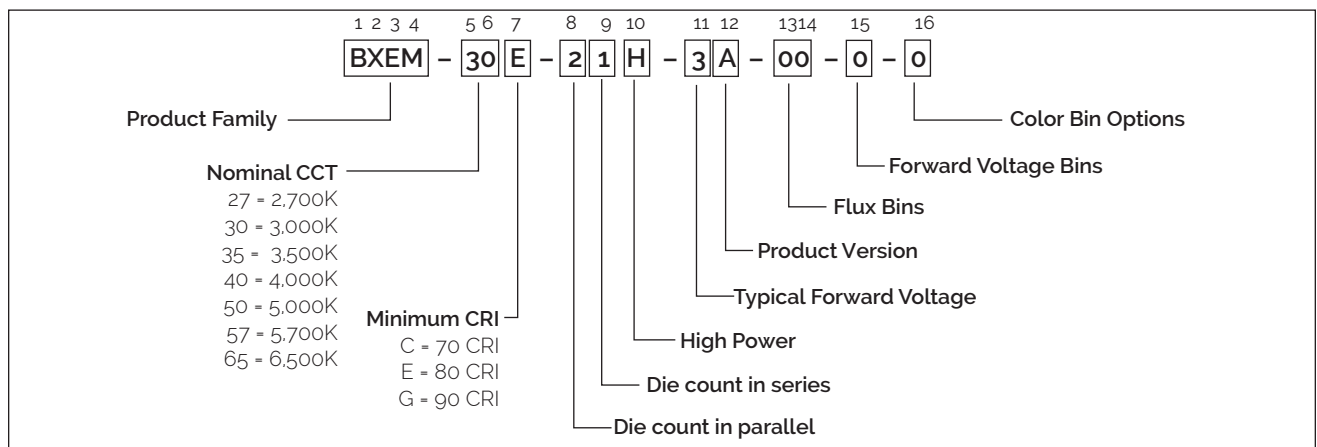
Bridgelux SMD LED products offer exceptional performance and color quality all in a highly reliable, cost effective, compact package. Our SMD products come in industry standard package sizes and follow ANSI binning standards.

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 Test Conditions

Bridgelux SMD 3030 LEDs are tested and binned with a 10ms pulse of 300mA at T_j (junction temperature) = T_{sp} (solder point temperature) = 25°C. Forward voltage and luminous flux are binned at a $T_j = T_{sp} = 25^\circ\text{C}$, 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 300mA ($T_j = T_{sp} = 25^\circ\text{C}$)

Part Number ^{1,6}	Nominal CCT ² (K)	CRI ^{3,5}	Nominal Drive Current (mA)	Forward Voltage ^{4,5} (V)			Minimum Pulsed Flux (lm) ^{4,5,7}	Typical Pulsed Flux (lm) ^{4,5}	Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max				
BXEM-27C-21H-3A-00-0-0	2700	70	300	2.9	3.2	3.3	110	123	1.0	128
BXEM-27E-21H-3A-00-0-0	2700	80	300	2.9	3.2	3.3	100	117	1.0	122
BXEM-27G-21H-3A-00-0-0	2700	90	300	2.9	3.2	3.3	80	98	1.0	102
BXEM-30C-21H-3A-00-0-0	3000	70	300	2.9	3.2	3.3	110	126	1.0	131
BXEM-30E-21H-3A-00-0-0	3000	80	300	2.9	3.2	3.3	110	123	1.0	128
BXEM-30G-21H-3A-00-0-0	3000	90	300	2.9	3.2	3.3	90	103	1.0	107
BXEM-35C-21H-3A-00-0-0	3500	70	300	2.9	3.2	3.3	110	129	1.0	134
BXEM-35E-21H-3A-00-0-0	3500	80	300	2.9	3.2	3.3	110	125	1.0	130
BXEM-35G-21H-3A-00-0-0	3500	90	300	2.9	3.2	3.3	90	105	1.0	109
BXEM-40C-21H-3A-00-0-0	4000	70	300	2.9	3.2	3.3	120	133	1.0	139
BXEM-40E-21H-3A-00-0-0	4000	80	300	2.9	3.2	3.3	110	127	1.0	132
BXEM-40G-21H-3A-00-0-0	4000	90	300	2.9	3.2	3.3	90	108	1.0	113
BXEM-50C-21H-3A-00-0-0	5000	70	300	2.9	3.2	3.3	120	133	1.0	139
BXEM-50E-21H-3A-00-0-0	5000	80	300	2.9	3.2	3.3	110	127	1.0	132
BXEM-50G-21H-3A-00-0-0	5000	90	300	2.9	3.2	3.3	90	108	1.0	113
BXEM-57C-21H-3A-00-0-0	5700	70	300	2.9	3.2	3.3	120	133	1.0	139
BXEM-57E-21H-3A-00-0-0	5700	80	300	2.9	3.2	3.3	110	127	1.0	132
BXEM-57G-21H-3A-00-0-0	5700	90	300	2.9	3.2	3.3	90	108	1.0	113
BXEM-65C-21H-3A-00-0-0	6500	70	300	2.9	3.2	3.3	120	133	1.0	139
BXEM-65E-21H-3A-00-0-0	6500	80	300	2.9	3.2	3.3	110	126	1.0	131
BXEM-65G-21H-3A-00-0-0	6500	90	300	2.9	3.2	3.3	90	108	1.0	113

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 7 SDCM color.
Example: BXEM-30E-21H-3A-00-0-0 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, 2x1 die configuration, high power, 3.2V typical forward voltage.
- Product CCT is hot targeted at $T_{sp} = 85^\circ\text{C}$. Nominal CCT as defined by ANSI C78.377-2011.
- Listed CRIs are minimum values and include test tolerance.
- Products tested under pulsed condition (10ms pulse width) at nominal drive current where $T_j = T_{sp} = 25^\circ\text{C}$.
- 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 3030.
- Refer to Table 6 and Table 7 for Bridgelux SMD 3030 Luminous Flux Binning and Forward Voltage Binning information.
- Minimum flux values are provided for reference only and are not guaranteed by 100% production testing.

Product Selection Guide

Table 2: Selection Guide, Stabilized DC Performance ($T_{sp} = 85^{\circ}\text{C}$)^{6,7}

Part Number ^{1,5}	Nominal CCT ² (K)	CRI ^{3,4}	Nominal Drive Current (mA)	Forward Voltage ⁴ (V)			Minimum DC Flux (lm) ^{4,8}	Typical DC Flux (lm) ⁴	Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max				
BXEM-27C-21H-3A-00-0-0	2700	70	300	2.7	3.0	3.1	91	102	0.9	113
BXEM-27E-21H-3A-00-0-0	2700	80	300	2.7	3.0	3.1	85	99	0.9	110
BXEM-27G-21H-3A-00-0-0	2700	90	300	2.7	3.0	3.1	68	83	0.9	92
BXEM-30C-21H-3A-00-0-0	3000	70	300	2.7	3.0	3.1	91	105	0.9	115
BXEM-30E-21H-3A-00-0-0	3000	80	300	2.7	3.0	3.1	94	105	0.9	115
BXEM-30G-21H-3A-00-0-0	3000	90	300	2.7	3.0	3.1	77	88	0.9	97
BXEM-35C-21H-3A-00-0-0	3500	70	300	2.7	3.0	3.1	92	108	0.9	120
BXEM-35E-21H-3A-00-0-0	3500	80	300	2.7	3.0	3.1	92	105	0.9	116
BXEM-35G-21H-3A-00-0-0	3500	90	300	2.7	3.0	3.1	77	90	0.9	100
BXEM-40C-21H-3A-00-0-0	4000	70	300	2.7	3.0	3.1	101	112	0.9	123
BXEM-40E-21H-3A-00-0-0	4000	80	300	2.7	3.0	3.1	92	107	0.9	118
BXEM-40G-21H-3A-00-0-0	4000	90	300	2.7	3.0	3.1	77	93	0.9	103
BXEM-50C-21H-3A-00-0-0	5000	70	300	2.7	3.0	3.1	102	113	0.9	125
BXEM-50E-21H-3A-00-0-0	5000	80	300	2.7	3.0	3.1	92	107	0.9	118
BXEM-50G-21H-3A-00-0-0	5000	90	300	2.7	3.0	3.1	77	92	0.9	101
BXEM-57C-21H-3A-00-0-0	5700	70	300	2.7	3.0	3.1	102	113	0.9	125
BXEM-57E-21H-3A-00-0-0	5700	80	300	2.7	3.0	3.1	92	107	0.9	118
BXEM-57G-21H-3A-00-0-0	5700	90	300	2.7	3.0	3.1	77	92	0.9	101
BXEM-65C-21H-3A-00-0-0	6500	70	300	2.7	3.0	3.1	102	113	0.9	125
BXEM-65E-21H-3A-00-0-0	6500	80	300	2.7	3.0	3.1	91	105	0.9	115
BXEM-65G-21H-3A-00-0-0	6500	90	300	2.7	3.0	3.1	77	92	0.9	101

Notes for Table 2:

- 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 7 SDCM color.
Example: BXEM-30E-21H-3A-00-0-0 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, 2x1 die configuration, high power, 3.2V typical forward voltage.
- Product CCT is hot targeted at $T_{sp} = 85^{\circ}\text{C}$. Nominal CCT as defined by ANSI C78.377-2011.
- Listed CRIs are minimum values and include test tolerance.
- 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 3030.
- Refer to Table 6 and Table 7 for Bridgelux SMD 3030 Luminous Flux Binning and Forward Voltage Binning information.
- Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.
- 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.
- Minimum flux values at elevated temperatures are provided for reference only and are not guaranteed by 100% production testing.

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 3.

Table 3: 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-21H-3A-00-0-0	70	60	2.8	0.2	28	24	168
		120	2.9	0.3	54	47	156
		200	3.1	0.6	86	74	142
		300	3.2	1.0	123	102	128
		400	3.4	1.3	153	125	114
BXEM-27E-21H-3A-00-0-0	80	60	2.8	0.2	27	23	160
		120	2.9	0.3	52	46	148
		200	3.1	0.6	82	72	135
		300	3.2	1.0	117	99	122
		400	3.4	1.3	145	122	108
BXEM-27G-21H-3A-00-0-0	90	60	2.8	0.2	22	20	134
		120	2.9	0.3	43	38	124
		200	3.1	0.6	69	61	113
		300	3.2	1.0	98	83	102
		400	3.4	1.3	122	102	91
BXEM-30C-21H-3A-00-0-0	70	60	2.8	0.2	29	25	172
		120	2.9	0.3	56	48	159
		200	3.1	0.6	89	76	145
		300	3.2	1.0	126	105	131
		400	3.4	1.3	157	128	117
BXEM-30E-21H-3A-00-0-0	80	60	2.8	0.2	28	25	168
		120	2.9	0.3	54	48	156
		200	3.1	0.6	86	76	142
		300	3.2	1.0	123	105	128
		400	3.4	1.3	153	128	114
BXEM-30G-21H-3A-00-0-0	90	60	2.8	0.2	24	21	141
		120	2.9	0.3	46	40	130
		200	3.1	0.6	72	64	119
		300	3.2	1.0	103	88	107
		400	3.4	1.3	128	108	95
BXEM-35C-21H-3A-00-0-0	70	60	2.8	0.2	30	26	177
		120	2.9	0.3	57	50	163
		200	3.1	0.6	91	79	148
		300	3.2	1.0	129	108	134
		400	3.4	1.3	160	133	120

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 $\pm 7.5\%$ tolerance on flux measurements.
3. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.

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 $T_{sp} = 25^\circ\text{C}$ (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-35E-21H-3A-00-0-0	80	60	2.8	0.2	29	25	171
		120	2.9	0.3	55	48	158
		200	3.1	0.6	88	77	144
		300	3.2	1.0	125	105	130
		400	3.4	1.3	155	129	116
BXEM-35G-21H-3A-00-0-0	90	60	2.8	0.2	24	21	144
		120	2.9	0.3	46	42	133
		200	3.1	0.6	74	66	121
		300	3.2	1.0	105	90	109
		400	3.4	1.3	130	111	97
BXEM-40C-21H-3A-00-0-0	70	60	2.8	0.2	31	26	182
		120	2.9	0.3	59	52	168
		200	3.1	0.6	93	81	153
		300	3.2	1.0	133	112	139
		400	3.4	1.3	165	137	123
BXEM-40E-21H-3A-00-0-0	80	60	2.8	0.2	29	25	174
		120	2.9	0.3	56	49	161
		200	3.1	0.6	89	78	146
		300	3.2	1.0	127	107	132
		400	3.4	1.3	158	131	118
BXEM-40G-21H-3A-00-0-0	90	60	2.8	0.2	25	22	148
		120	2.9	0.3	48	43	137
		200	3.1	0.6	76	68	124
		300	3.2	1.0	108	93	113
		400	3.4	1.3	134	114	100
BXEM-50C-21H-3A-00-0-0	70	60	2.8	0.2	31	27	182
		120	2.9	0.3	59	52	168
		200	3.1	0.6	93	82	153
		300	3.2	1.0	133	113	139
		400	3.4	1.3	165	139	123
BXEM-50E-21H-3A-00-0-0	80	60	2.8	0.2	29	25	174
		120	2.9	0.3	56	49	161
		200	3.1	0.6	89	78	146
		300	3.2	1.0	127	107	132
		400	3.4	1.3	158	131	118
BXEM-50G-21H-3A-00-0-0	90	60	2.8	0.2	25	22	148
		120	2.9	0.3	48	42	137
		200	3.1	0.6	76	67	124
		300	3.2	1.0	108	92	113
		400	3.4	1.3	134	113	100

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 $\pm 7.5\%$ tolerance on flux measurements.
3. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.

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 $T_{sp} = 25^\circ\text{C}$ (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-57C-21H-3A-00-0-0	70	60	2.8	0.2	31	27	182
		120	2.9	0.3	59	52	168
		200	3.1	0.6	93	82	153
		300	3.2	1.0	133	113	139
		400	3.4	1.3	165	139	123
BXEM-57E-21H-3A-00-0-0	80	60	2.8	0.2	29	25	174
		120	2.9	0.3	56	49	161
		200	3.1	0.6	89	78	146
		300	3.2	1.0	127	107	132
		400	3.4	1.3	158	131	118
BXEM-57G-21H-3A-00-0-0	90	60	2.8	0.2	25	22	148
		120	2.9	0.3	48	42	137
		200	3.1	0.6	76	67	124
		300	3.2	1.0	108	92	113
		400	3.4	1.3	134	113	100
BXEM-65C-21H-3A-00-0-0	70	60	2.8	0.2	31	27	182
		120	2.9	0.3	59	52	168
		200	3.1	0.6	93	82	153
		300	3.2	1.0	133	113	139
		400	3.4	1.3	165	139	123
BXEM-65E-21H-3A-00-0-0	80	60	2.8	0.2	29	25	172
		120	2.9	0.3	56	48	159
		200	3.1	0.6	89	76	145
		300	3.2	1.0	126	105	131
		400	3.4	1.3	157	128	117
BXEM-65G-21H-3A-00-0-0	90	60	2.8	0.2	25	22	148
		120	2.9	0.3	48	42	137
		200	3.1	0.6	76	67	124
		300	3.2	1.0	108	92	113
		400	3.4	1.3	134	113	100

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 $\pm 7.5\%$ 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 4: Electrical Characteristics

Part Number ¹	Nominal Drive Current (mA)	Forward Voltage (V) ^{2,3}			Typical Coefficient of Forward Voltage ⁴ $\Delta V_f / \Delta T$ (mV/°C)	Typical Thermal Resistance Junction to Solder Point ^{5,6} R_{j-sp} (C/W)
		Minimum	Typical	Maximum		
BXEM-xxx-21H-3A-00-0-0	300	2.9	3.2	3.3	-3	12

Notes for Table 4:

- 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 7 SDCM color.
Example: BXEM-30E-21H-3A-00-0-0 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, 2x1 die configuration, high power, 3.2V typical forward voltage.
- Bridgelux maintains a tolerance of $\pm 0.1V$ on forward voltage measurements. Voltage minimum and maximum values at the rated test current are guaranteed by 100% test.
- Products tested under pulsed condition (10ms pulse width) at nominal drive current where $T_{sp} = 25^{\circ}C$.
- Typical Coefficient of Forward Voltage tolerance of $\pm 1mV$ from nominal current.
- Thermal Resistance values based on 3000K 80CRI product.
- 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 +100°C
Operating Solder Point Temperature (T_{sp})	-40°C to +100°C
Soldering Temperature	260°C or lower for a maximum of 10 seconds
Maximum Drive Current	400mA
Maximum Reverse Voltage ¹	-5V
Moisture Sensitivity Rating	MSL 3
Electrostatic Discharge	2kV HBM. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Notes for Table 5:

1. 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 3030 LEDs. Although several bins are outlined, 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 300mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
4A	80	90	lm	$I_F=300\text{mA}$
4B	90	100		
4C	100	110		
4D	110	120		
4E	120	130		
4F	130	140		
4G	140	150		
4H	150	160		

Note for Table 6:

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

Table 7: Forward Voltage Bin Definition at 300mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
B	2.9	3.0	V	$I_F=300\text{mA}$
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 $\pm 0.1\text{V}$ on forward voltage measurements.

Product Bin Definitions

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

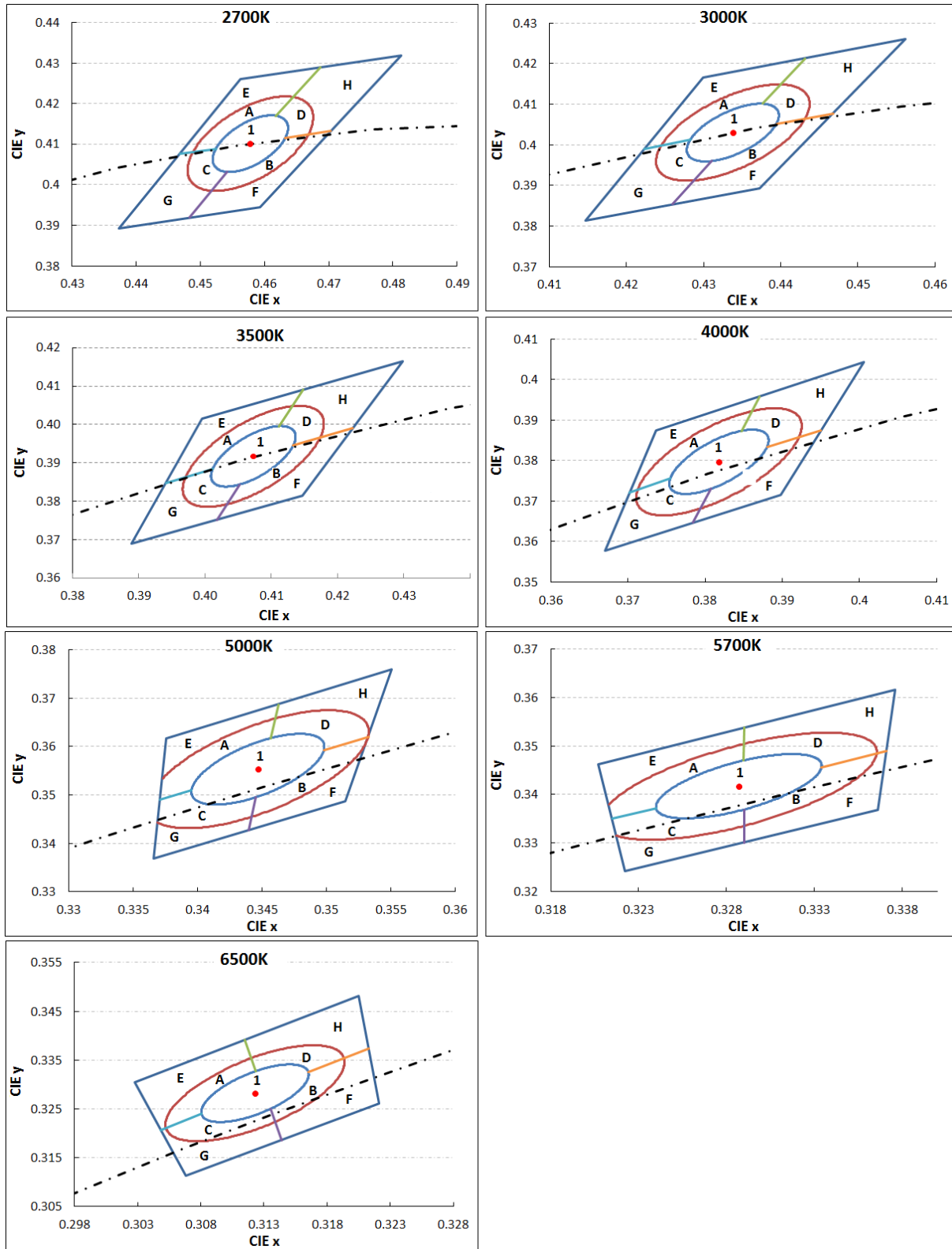
CCT	Color Space	Center Point		Major Axis	Minor Axis	Ellipse Rotation Angle	Color Bin
		X	Y				
2700K	3 SDCM	0.4578	0.4101	0.00810	0.00420	53.70	1
	5 SDCM	0.4578	0.4101	0.01350	0.00700	53.70	1/A/B/C/D
3000K	3 SDCM	0.4338	0.4030	0.00834	0.00408	53.22	1
	5 SDCM	0.4338	0.4030	0.01390	0.00680	53.22	1/A/B/C/D
3500K	3 SDCM	0.4103	0.3961	0.00927	0.00414	54.00	1
	5 SDCM	0.4103	0.3961	0.01545	0.00690	54.00	1/A/B/C/D
4000K	3 SDCM	0.3818	0.3797	0.00939	0.00402	53.72	1
	5 SDCM	0.3818	0.3797	0.01565	0.00670	53.72	1/A/B/C/D
5000K	3 SDCM	0.3447	0.3553	0.00822	0.00354	59.62	1
	5 SDCM	0.3447	0.3553	0.01370	0.00590	59.62	1/A/B/C/D
5700K	3 SDCM	0.3287	0.3417	0.00746	0.00320	59.09	1
	5 SDCM	0.3287	0.3417	0.01243	0.00533	59.09	1/A/B/C/D
6500K	3 SDCM	0.3123	0.3282	0.00669	0.00285	58.57	1
	5 SDCM	0.3123	0.3282	0.01115	0.00475	58.57	1/A/B/C/D

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.

Product Bin Definitions

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



Performance Curves

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

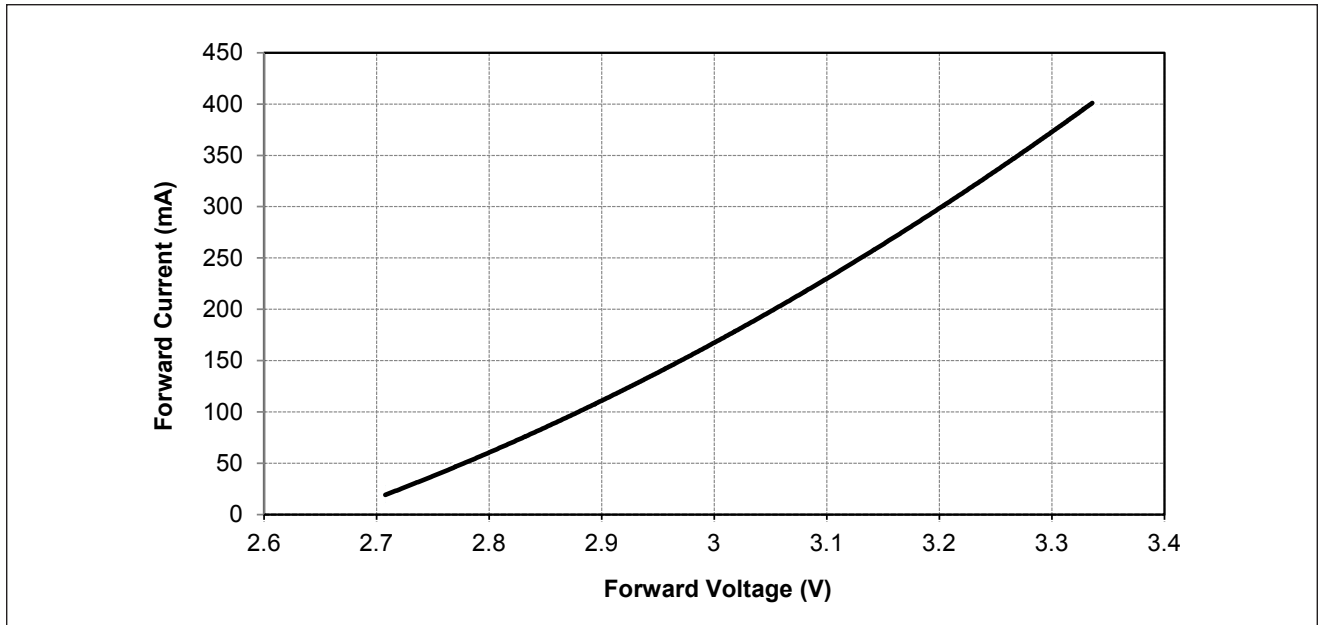
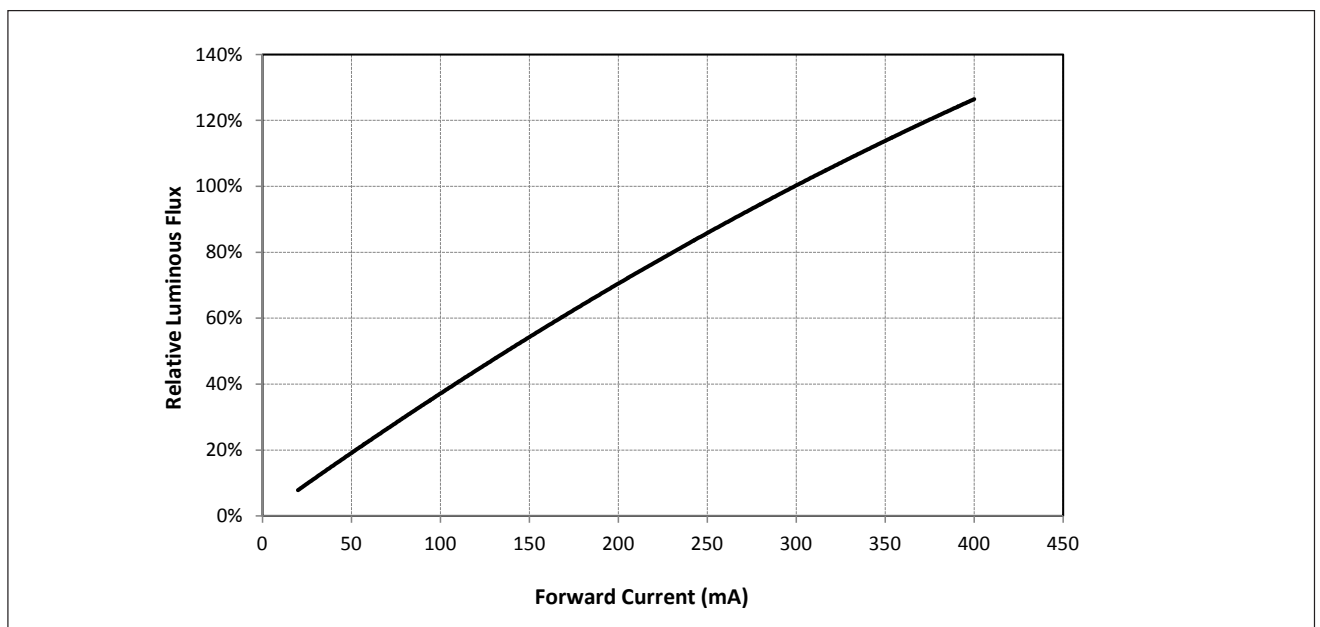


Figure 3: Typical Relative Luminous Flux vs. Drive Current ($T_{sp}=25^{\circ}\text{C}$)



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: Typical Relative DC Flux vs. Solder Point Temperature

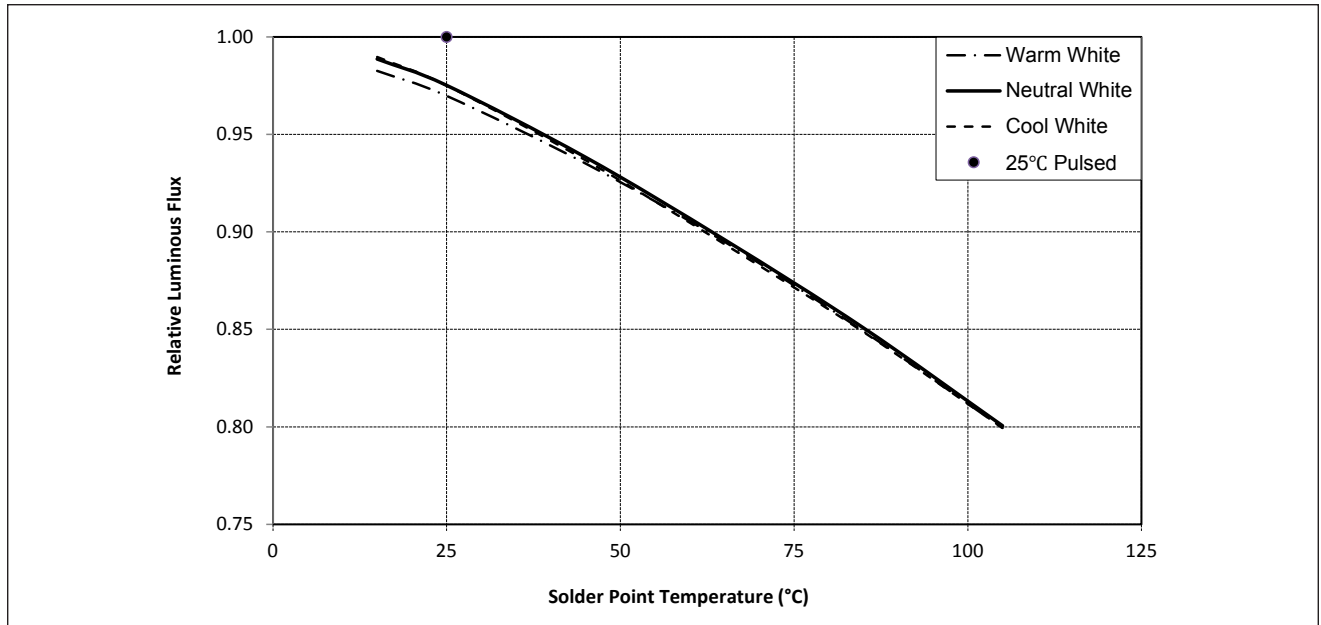
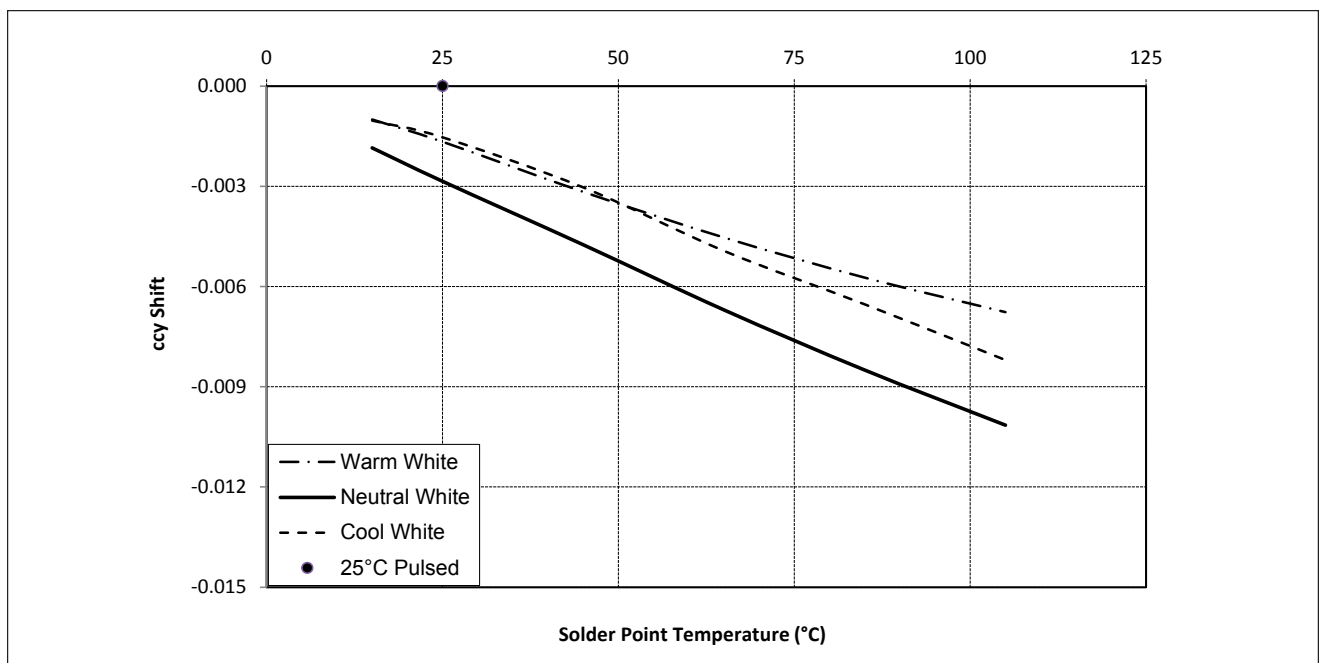


Figure 5: Typical DC ccy Shift vs. Solder Point Temperature

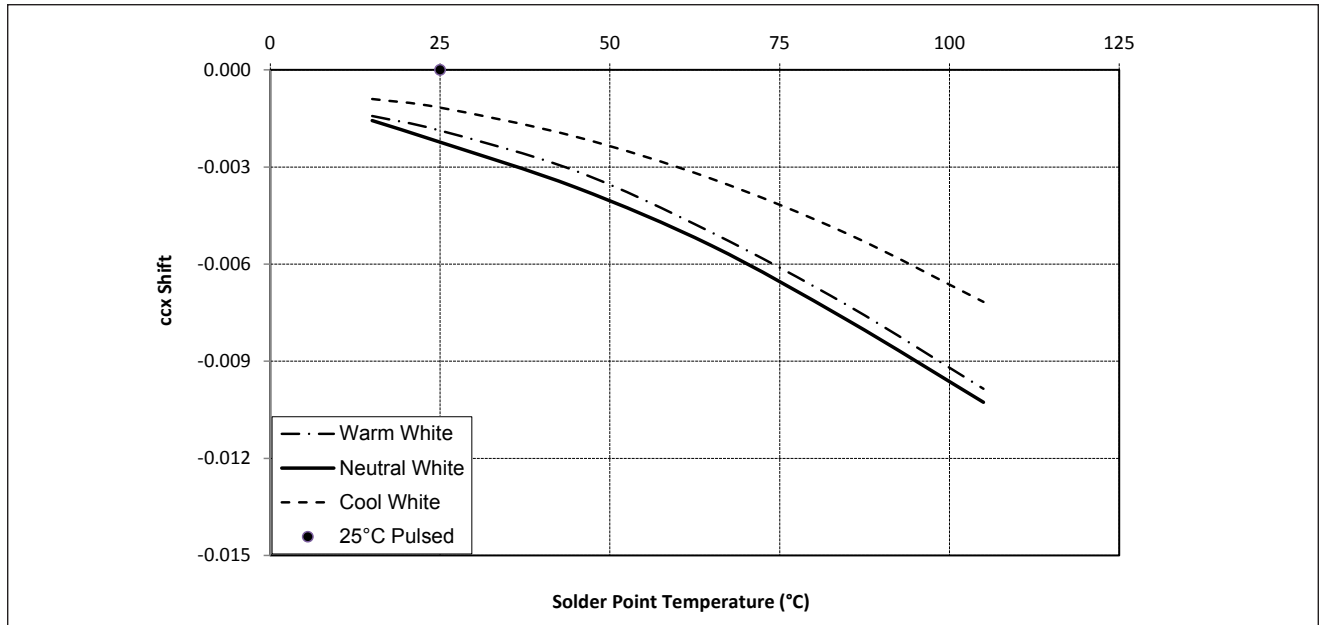


Notes for Figures 4 & 5:

1. Characteristics shown for warm white based on 3000K and 80 CRI.
2. Characteristics shown for neutral white based on 4000K and 80 CRI.
3. Characteristics shown for cool white based on 5000K and 70 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 ccx Shift vs. Solder Point Temperature

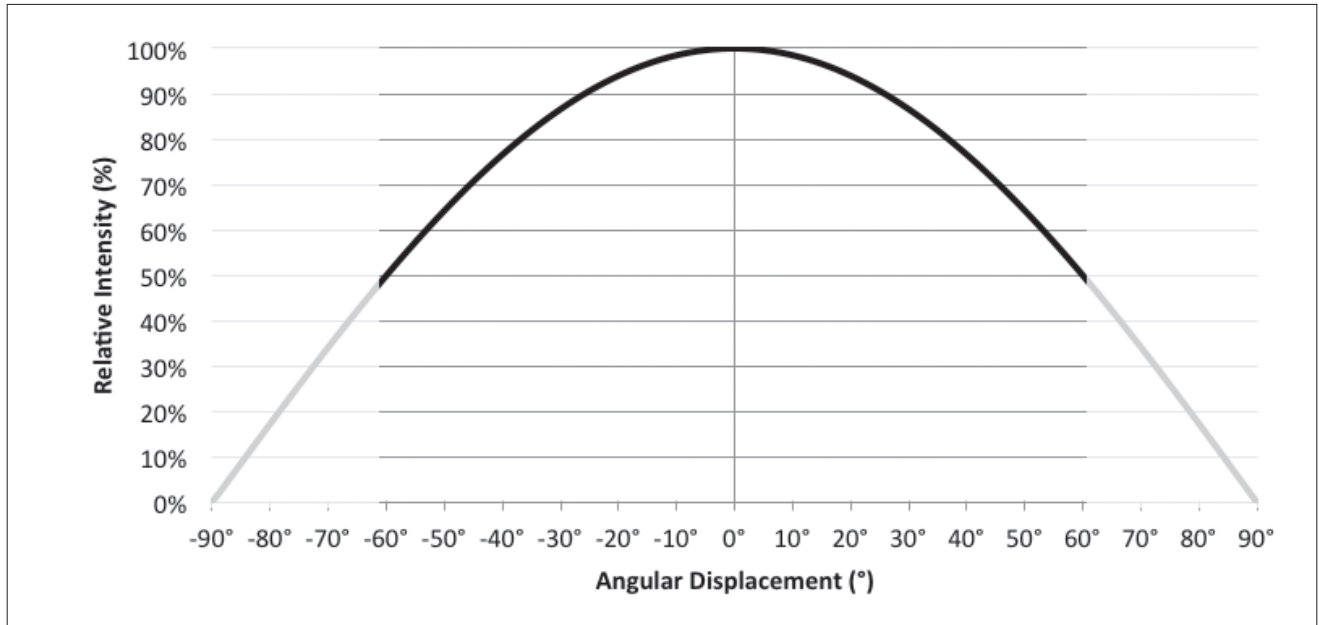


Notes for Figure 6:

1. Characteristics shown for warm white based on 3000K and 80 CRI.
2. Characteristics shown for neutral white based on 4000K and 80 CRI.
3. Characteristics shown for cool white based on 5000K and 70 CRI.
4. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information.

Typical Radiation Pattern

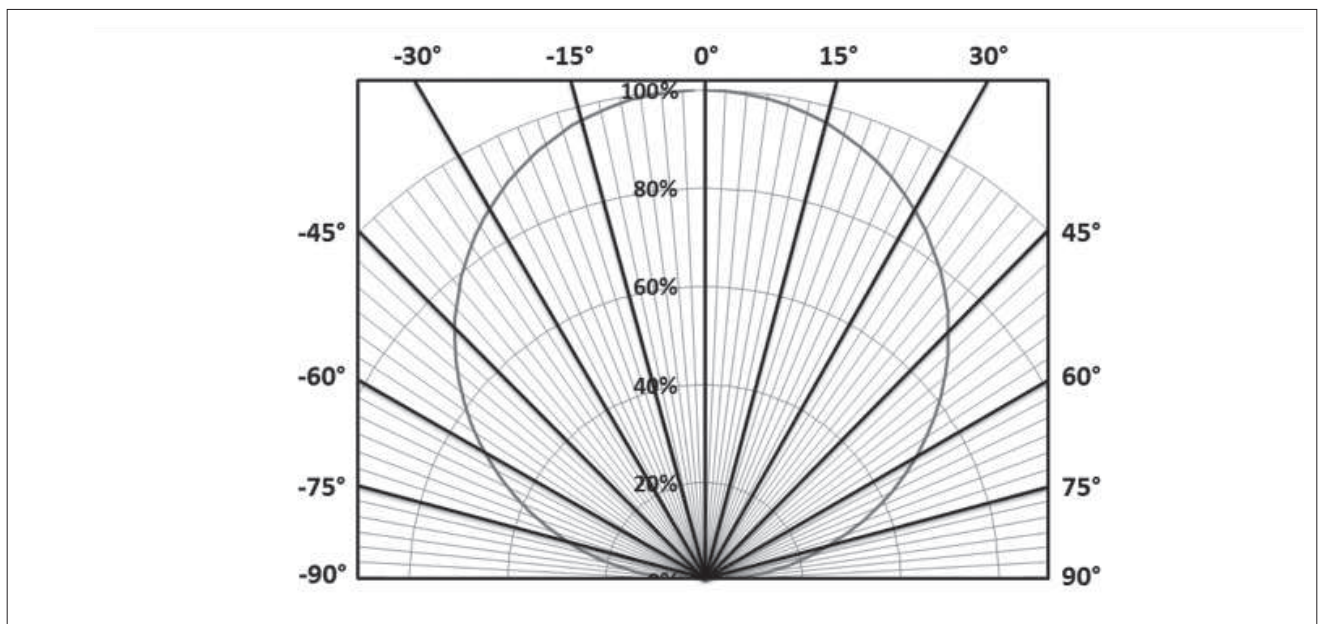
Figure 7: Typical Spatial Radiation Pattern at 300mA, $T_{sp} = 25^{\circ}\text{C}$



Notes for Figure 7:

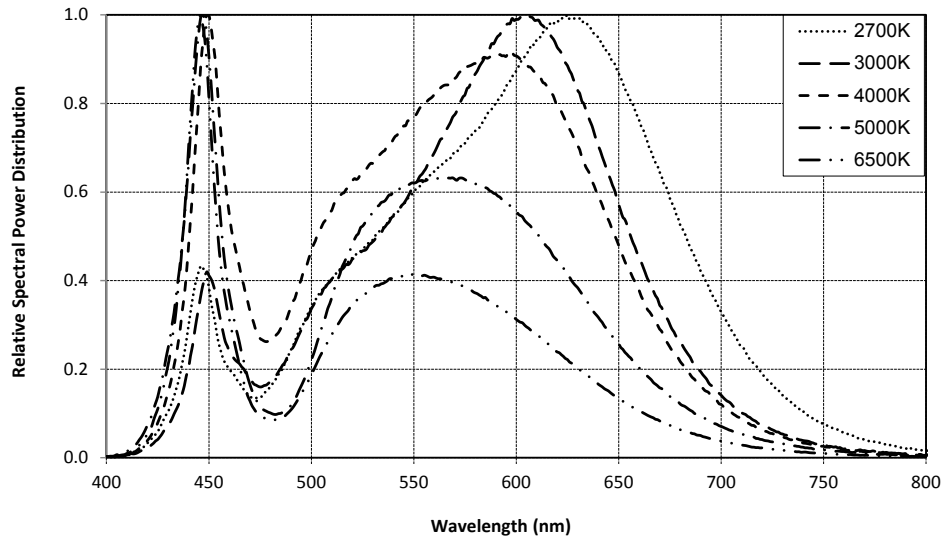
1. Typical viewing angle is 120° .
2. The viewing angle is defined as the off axis angle from the centerline where I_v is $\frac{1}{2}$ of the peak value.

Figure 8: Typical Polar Radiation Pattern at 300mA, $T_{sp} = 25^{\circ}\text{C}$



Typical Color Spectrum

Figure 9: Typical Color Spectrum

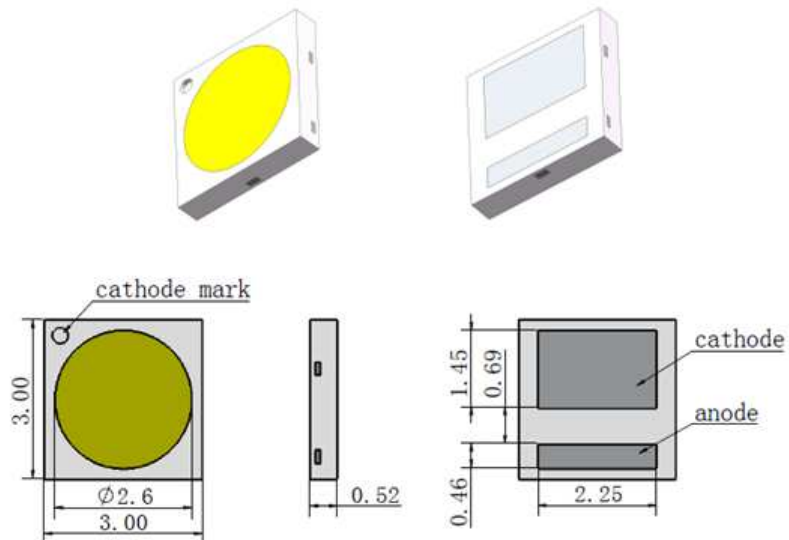


Notes for Figure 9:

1. Color spectra measured at nominal current for $T_{sp} = 25^{\circ}\text{C}$
2. Color spectra shown for warm white is 2700K and 90 CRI.
3. Color spectra shown for warm white is 3000K and 80 CRI.
4. Color spectra shown for neutral white is 4000K and 80 CRI.
5. Color spectra shown for cool white is 5000K and 70 CRI.
6. Color spectra shown for cool white is 6500K and 70 CRI.

Mechanical Dimensions

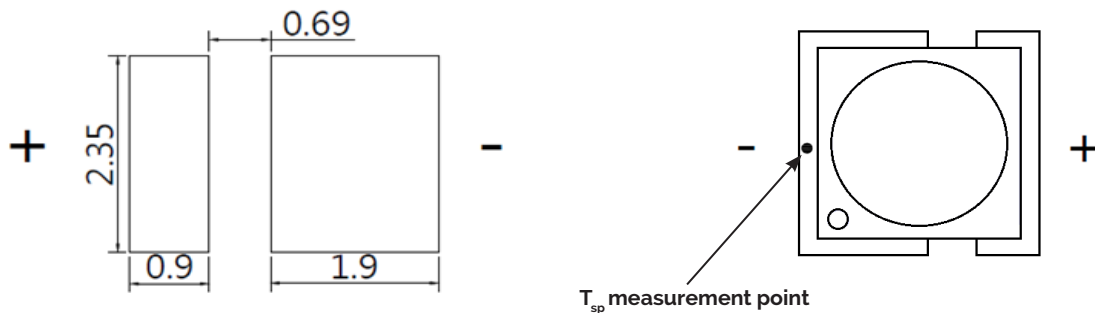
Figure 10: Drawing for SMD 3030



Notes for Figure 10:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are ± 0.10 mm.
4. The optical center of the LED emitter is nominally defined by the mechanical center of the emitter. The light emitting surface (LES) is centered on the mechanical center of the LED emitter to a tolerance of ± 0.2 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: 85°C , 60%RH, 168hr		3 reflows	0/22
2	Low Temperature Storage	JESD22-A119	$T_{\text{a}} = -40^{\circ}\text{C}$		1000 hours	0/22
3	High Temperature Storage	JESD22-A103D	$T_{\text{a}} = 100^{\circ}\text{C}$		1000 hours	0/22
4	Low Temperature Operating Life	JESD22-A108D	$T_{\text{a}} = -40^{\circ}\text{C}$	300mA	1000 hours	0/22
5	Temperature Humidity Operating Life	JESD22-A101C	$T_{\text{sp}} = 85^{\circ}\text{C}$, RH=85%	300mA	1000 hours	0/22
6	High Temperature Operating Life	JESD22-A108D	$T_{\text{sp}} = 105^{\circ}\text{C}$	400mA	1000 hours	0/22
7	Thermal Shock	JESD22-A106B	$T_{\text{a}} = -40^{\circ}\text{C} \sim 100^{\circ}\text{C}$; Dwell : 15min; Transfer: 10sec		200 Cycle	0/22
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 Cycle	0/22
9	Electrostatic Discharge	JS-001-2012	HBM, 2kV, 15k Ω , 100pF, Alternately positive or negative			0/22

Passing Criteria

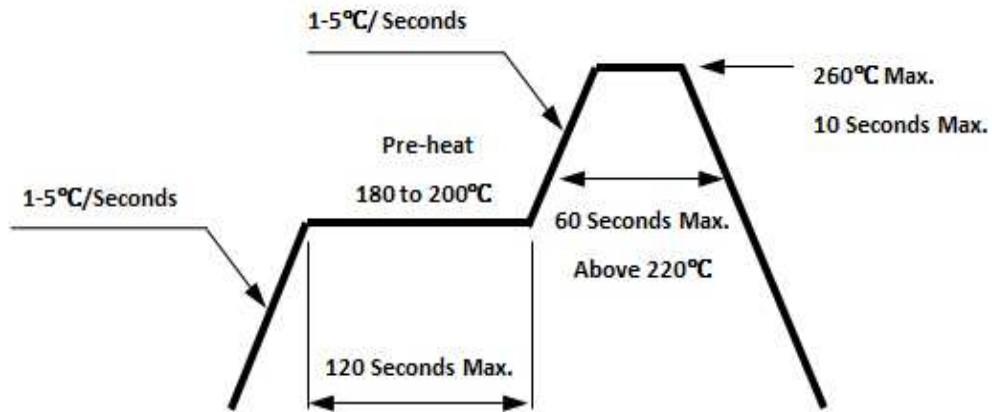
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	300mA	$\Delta V_f < 10\%$
Luminous Flux	Iv	300mA	$\Delta I_v < 30\%$
Chromaticity Coordinates	(x, y)	300mA	$\Delta u'v' < 0.007$

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

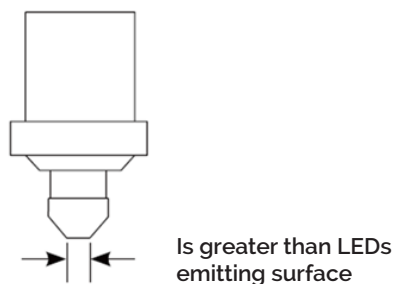
Reflowing Characteristics

Figure 11 : 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 12 : Pick and Place

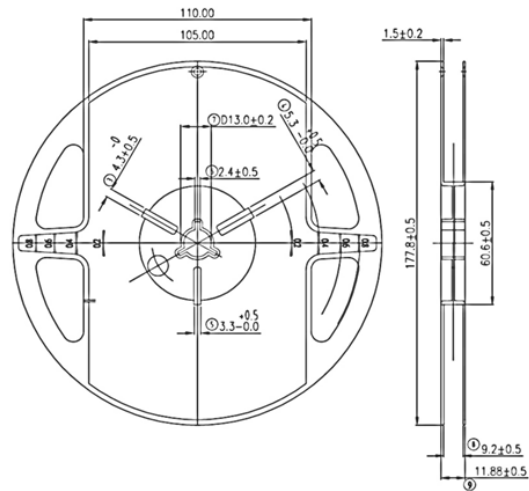


Note for Figure 12:

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

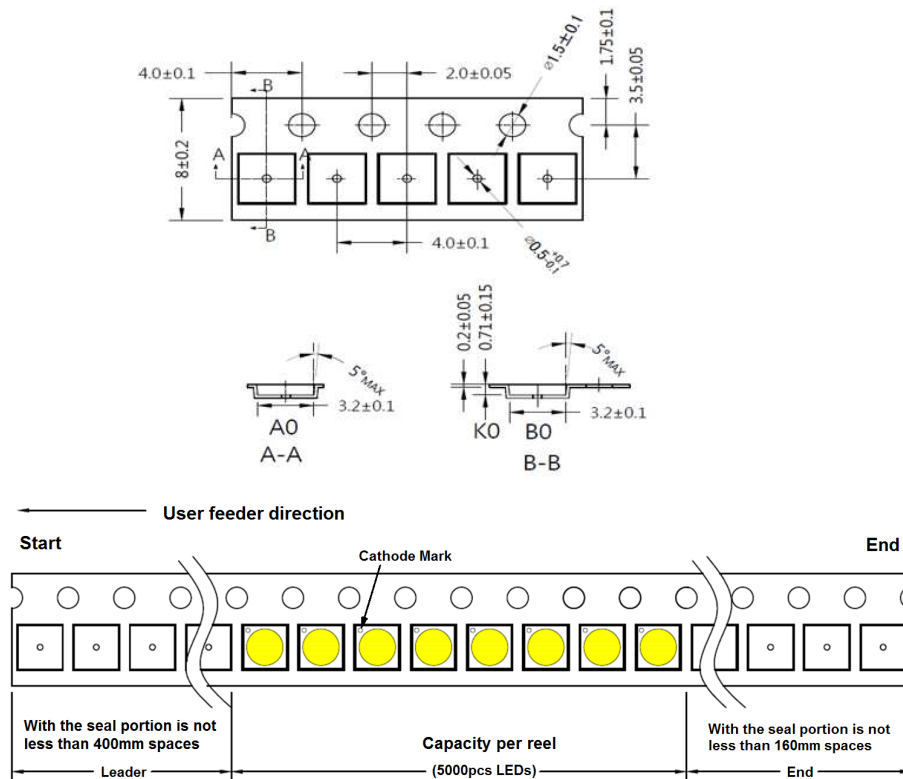
Figure 13: Emitter Reel Drawings



Note for Figure 13:

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

Figure 14: Emitter Tape Drawings

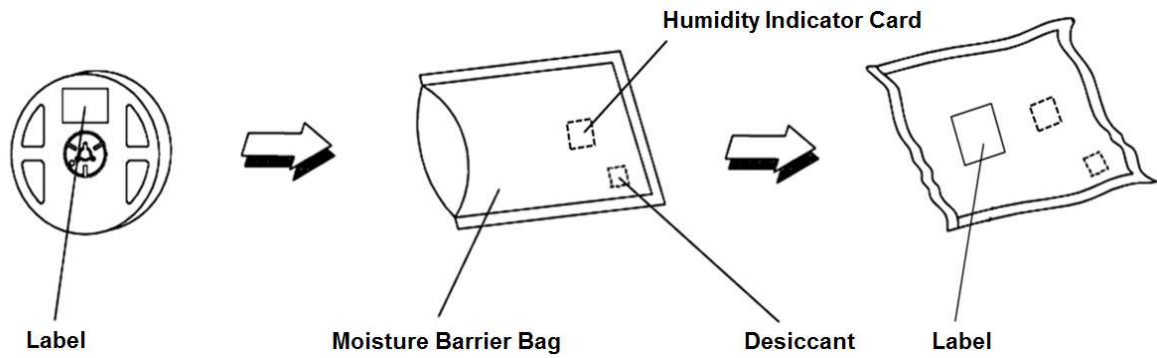


Note for Figure 14:

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

Optical Source Models

Optical source models and ray set files are available for all Bridgelux products. For a list of available formats, visit www.bridgelux.com.

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 Exempt 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.