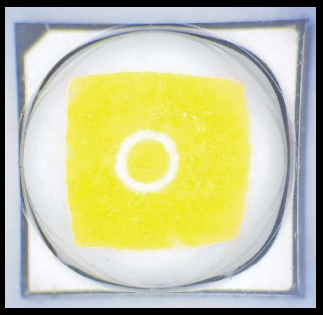
Bridgelux® SMD 3535 2W3V Series

Product Data Sheet DS1730

Introduction

SMD 3535



Features

- Package: SMT ceramic package with silicone lens
- Lumen maintenance: Test results according to IESNA LM-80 available
- ESD8kV HBM. JEDEC-JS-001-HBM and JE-DEC-JS-001-2012
- Operates at a maximum current of up to 2.0A
- Hot binning @ 85 °C

Application

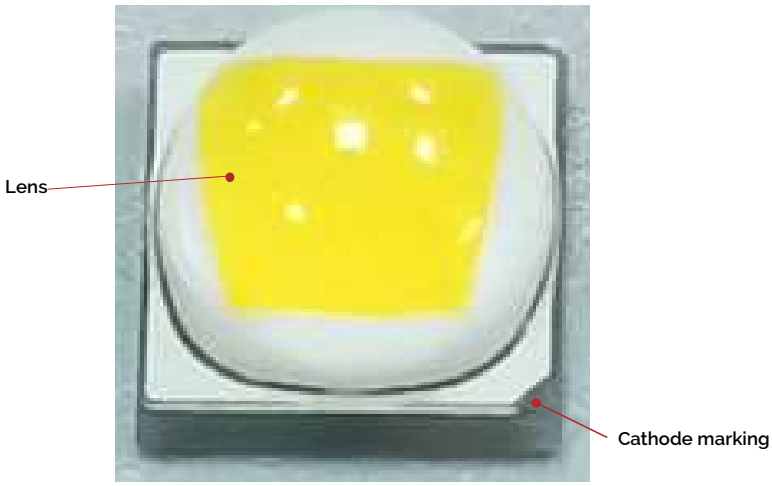
- Indoor Lighting: Spotlight, Downlight
- Outdoor Lighting: Street Light, Tunnel Light, Security Light, Area Light, Stadium/Arena Light
- Industrial Lighting: High Bay Light, Low Bay Light
- Consumer Lighting: Torch Light

Pb free RoHS

Contents

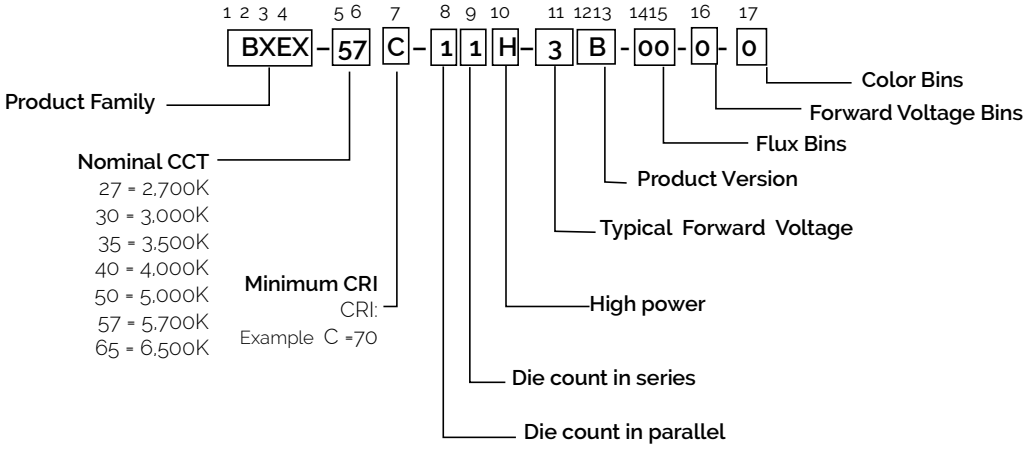
Product Feature Map

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



Product Nomenclature

The part number designation for Bridgelux SMD 3535 is explained as follows:



Product Test Conditions

Bridgelux SMD 3535 LEDs are tested and binned with a 10ms pulse of 700mA at T_j (junction temperature)=T_{sp}(solder point temperature) =85°C. Luminous flux , color and forward voltage are binned at T_j=T_{sp}=85°C.

Product Selection Guide

The following product configurations are available:

Table 1: Selection Guide, Pulsed Measurement Data at 700mA (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[4,5] (lm)	Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max			
BXEX-22C-11H-3B-00-0-0	2200	70	700	2.80	2.93	3.10	335	2.05	163
BXEX-27C-11H-3B-00-0-0	2700	70	700	2.80	2.93	3.10	361	2.05	176
BXEX-30C-11H-3B-00-0-0	3000	70	700	2.80	2.93	3.10	382	2.05	186
BXEX-35C-11H-3B-00-0-0	3500	70	700	2.80	2.93	3.10	390	2.05	190
BXEX-40C-11H-3B-00-0-0	4000	70	700	2.80	2.93	3.10	408	2.05	199
BXEX-50C-11H-3B-00-0-0	5000	70	700	2.80	2.93	3.10	408	2.05	199
BXEX-57C-11H-3B-00-0-0	5700	70	700	2.80	2.93	3.10	408	2.05	199
BXEX-65C-11H-3B-00-0-0	6500	70	700	2.80	2.93	3.10	408	2.05	199

Notes for Table 1 :

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: BXEX-57C-11H-3B-00-0-0 refers to the full distribution of flux, forward voltage, and color within a 5700K 7-step ANSI standard chromaticity region with a minimum of 70 CRI, 1x1 die configuration, high power, 2.93V typical forward voltage.
2. Product CCT is hot targeted at Tsp = 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.
5. Bridgelux maintains a ±7.5% tolerance on luminous flux measurements, ±0.15V tolerance on forward voltage measurements, and ±2 tolerance on CRI measurements for the SMD 3535.
6. Refer to Table 6 and Table 7 for Bridgelux SMD 3535 Luminous Flux Binning and Forward Voltage Binning information.

Product Selection Guide

Table 2: Selection Guide, Pulsed Measurement Data at 700mA (T_j=T_{sp}=85°C)

Part Number[1,5]	Nominal CCT[2] (K)	CRI[3, 4]	Nominal Drive Current (mA)	Forward Voltage[4] (V)			Typical Pulsed Flux[4] (lm)	Typical Power (W)	Typical Efficacy (lm/W)
				Min	Typical	Max			
BXEX-22C-11H-3B-00-0-0	2200	70	700	2.70	2.83	3.00	305	1.98	154
BXEX-27C-11H-3B-00-0-0	2700	70	700	2.70	2.83	3.00	330	1.98	167
BXEX-30C-11H-3B-00-0-0	3000	70	700	2.70	2.83	3.00	350	1.98	176
BXEX-35C-11H-3B-00-0-0	3500	70	700	2.70	2.83	3.00	357	1.98	180
BXEX-40C-11H-3B-00-0-0	4000	70	700	2.70	2.83	3.00	372	1.98	188
BXEX-50C-11H-3B-00-0-0	5000	70	700	2.70	2.83	3.00	372	1.98	188
BXEX-57C-11H-3B-00-0-0	5700	70	700	2.70	2.83	3.00	372	1.98	188
BXEX-65C-11H-3B-00-0-0	6500	70	700	2.70	2.83	3.00	372	1.98	188

Notes for Table 2 :

1. The last 6 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-0-0" denotes the full . distribution of flux, forward voltage, and color bin.
   Example: BXEX-57C-11H-3B-00-0-0 refers to the full distribution of flux, forward voltage, and color within a 5700K 7-step ANSI standard chromaticity region with a minimum of 70CRI, 1x1 die configuration, high power, 2.83V typical forward voltage.
2. Product CCT is hot targeted at Tsp = 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.
5. Bridgelux maintains a ±7.5% tolerance on luminous flux measurements, ±0.15V tolerance on forward voltage measurements, and ±2 tolerance on CRI measurements for the SMD 3535.
6. Refer to Table 6 and Table 7 for Bridgelux SMD 3535 Luminous Flux Binning and Forward Voltage Binning information.

Performance at Commonly Used Drive Currents

SMD 3535 LEDs specifications at nominal drive current are shown in Table 1 and Table 2. SMD 3535 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 Pulsed Flux[3] T_{sp} = 85°C (lm)	Typical Efficacy T_{sp} = 25°C (lm/W)
BXEX-22C-11H-3B-00-0-0	70	50	2.68	0.13	27	25	202
		350	2.82	0.99	177	161	179
		700	**2.93**	**2.05**	**335**	**305**	**163**
		840	2.97	2.50	395	359	158
		1100	3.04	3.35	503	456	150
		1400	3.12	4.37	617	560	141
		1800	3.23	5.81	758	688	130
		2000	3.26	6.51	804	730	123
BXEX-27C-11H-3B-00-0-0	70	50	2.68	0.13	28	26	212
		350	2.82	0.99	191	173	194
		700	**2.93**	**2.05**	**361**	**330**	**176**
		840	2.97	2.50	426	386	171
		1100	3.04	3.35	538	488	161
		1400	3.12	4.37	659	598	151
		1800	3.23	5.81	807	732	139
		2000	3.26	6.51	866	786	133
BXEX-30C-11H-3B-00-0-0	70	50	2.68	0.13	30	28	226
		350	2.82	0.99	202	185	205
		700	**2.93**	**2.05**	**382**	**350**	**186**
		840	2.97	2.50	451	410	181
		1100	3.04	3.35	570	519	170
		1400	3.12	4.37	697	634	160
		1800	3.23	5.81	855	777	147
		2000	3.26	6.51	909	827	139
BXEX-35C-11H-3B-00-0-0	70	50	2.68	0.13	30	28	227
		350	2.82	0.99	205	187	207
		700	**2.93**	**2.05**	**390**	**357**	**190**
		840	2.97	2.50	455	415	182
		1100	3.04	3.35	574	524	172
		1400	3.12	4.37	703	641	161
		1800	3.23	5.81	861	786	148
		2000	3.26	6.51	936	854	144
BXEX-40C-11H-3B-00-0-0 BXEX-50C-11H-3B-00-0-0 BXEX-57C-11H-3B-00-0-0 BXEX-65C-11H-3B-00-0-0	70	50	2.68	0.13	33	30	244
		350	2.82	0.99	213	194	216
		700	**2.93**	**2.05**	**408**	**372**	**199**
		840	2.97	2.50	475	433	191
		1100	3.04	3.35	601	547	180
		1400	3.12	4.37	735	670	168
		1800	3.23	5.81	902	821	155
		2000	3.26	6.51	978	891	150

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 pulsed performance values are provided as reference only and are not a guarantee of performance.

Electrical and Thermal Characteristics

Table 4: Electrical and Thermal Characteristics

Part Number [1]	Drive Current (mA)	Forward Voltage[2,3] (V)			Typical Temperature Coefficient of Forward Voltage[4] $\Delta V_f/\Delta T$ (mV/°C)	Typical Thermal Resistance Junction to Solder Point[5,6] $R_{j\text{-}sp}$ (°C/W)
		Minimum	Typical	Maximum		
BXEX-xxx-11H-3B-00-0-0	700	2.70	2.83	3.0	-1.3	3.0

Notes for Table 4:

1. The last 6 characters (including hyphens '-') refer to nominal flux, nominal forward voltage, and color bins, respectively. "00-0-0" denotes the full distribution of flux, forward voltage, and color bin .

   Example: BXEX-57C-11H-3B-00-0-0 refers to the full distribution of flux, forward voltage, and color within a 5700K ANSI standard chromaticity region with a minimum of 70 CRI.
2. Products tested under pulsed condition (10ms pulse width) where T_{sp} = 85°C.
3. Bridgelux maintains a tolerance of ± 0.15V on forward voltage measurements.
4. Products measured between 25°C and 105°C under pulsed condition (10ms pulse width).
5. Thermal Resistance values based on 5700K 70 CRI product.
6. 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)	150˚C
Storage Temperature	-40˚C to +120˚C
Operating Solder Point Temperature (T_{Sp})	-40˚C to +105˚C
Soldering Temperature	260˚C or lower for a maximum of 10 seconds
DC Forward Current	2000mA
Reverse Voltage[2]	-
Peak Pulse Forward Current [1]	2600mA
Moisture Sensitivity Rating	MSL3
Electrostatic Discharge	8kV HBM. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Notes for Table 5:

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

Product Bin Definitions

Table 6 lists the standard photometric luminous flux bins for Bridgelux SMD 3535 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 700mA, T_{sp}=85˚C

Bin Code	Minimum	Maximum	Unit	Condition
D9	310	330	lm	I_F=700mA
E6	330	350		
E7	350	370		
E8	370	390		
E9	390	410		

Note for Table 6:

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

Table 7: Forward Voltage Bin Definition at 700mA, T_{sp}=85˚C

Bin Code	Minimum	Maximum	Unit	Condition
H	2.5	2.7	V	I_F=700mA
J	2.7	2.9		
K	2.9	3.1		

Note for Table 7:

1. Bridgelux maintains a tolerance of ± 0.15V on forward voltage measurements.

Table 8: Color Bins at 700mA, T_{sp}=85˚C

CCT(K)	CRI(Ra)	Color Rank	Chromaticity Bins
2200/2700 3000/3500/4000	70	0(All bin)	A,B,C,D,E,F,G,H,J,K,L,M,N,P,Q,R
		5(Main bin)	F,G,K,L
		3(3SDCM)	MacAdam 3-step
5000/5700/6500	70	0(All bin)	A,B,C,D
		5(5SDCM)	MacAdam 5-step

Product Bin Definitions

Table 8: Color Bin Definition

2200K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.4805	0.3968	B	0.4854	0.3968	C	0.4903	0.3969	D	0.4952	0.3969
	0.4854	0.3968		0.4903	0.3969		0.4952	0.3969		0.5000	0.3969
	0.4915	0.4062		0.4966	0.4062		0.5016	0.4062		0.5066	0.4062
	0.4865	0.4062		0.4915	0.4062		0.4966	0.4062		0.5016	0.4062
E	0.4865	0.4062	F	0.4915	0.4062	G	0.4966	0.4062	H	0.5016	0.4062
	0.4915	0.4062		0.4966	0.4062		0.5016	0.4062		0.5066	0.4062
	0.4976	0.4156		0.5028	0.4156		0.5080	0.4156		0.5132	0.4156
	0.4925	0.4156		0.4976	0.4156		0.5028	0.4156		0.5080	0.4156
J	0.4925	0.4156	K	0.4976	0.4156	L	0.5028	0.4156	M	0.5080	0.4156
	0.4976	0.4156		0.5028	0.4156		0.5080	0.4156		0.5132	0.4156
	0.5038	0.4250		0.5091	0.4249		0.5145	0.4249		0.5198	0.4249
	0.4984	0.4250		0.5038	0.4250		0.5091	0.4249		0.5145	0.4249
N	0.4984	0.4250	P	0.5038	0.4250	Q	0.5091	0.4249	R	0.5145	0.4249
	0.5038	0.4250		0.5091	0.4249		0.5145	0.4249		0.5198	0.4249
	0.5099	0.4344		0.5154	0.4343		0.5209	0.4342		0.5264	0.4342
	0.5044	0.4344		0.5099	0.4344		0.5154	0.4343		0.5209	0.4342

2700K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.4373	0.3893	B	0.4428	0.3906	C	0.4483	0.3919	D	0.4538	0.3931
	0.4418	0.3981		0.4475	0.3994		0.4532	0.4008		0.4589	0.4021
	0.4475	0.3994		0.4532	0.4008		0.4589	0.4021		0.4646	0.4034
	0.4428	0.3906		0.4483	0.3919		0.4538	0.3931		0.4593	0.3944
E	0.4418	0.3981	F	0.4475	0.3994	G	0.4532	0.4008	H	0.4589	0.4021
	0.4465	0.4071		0.4523	0.4085		0.4582	0.4099		0.4641	0.4112
	0.4523	0.4085		0.4582	0.4099		0.4641	0.4112		0.4700	0.4126
	0.4475	0.3994		0.4532	0.4008		0.4589	0.4021		0.4646	0.4034
J	0.4465	0.4071	K	0.4523	0.4085	L	0.4582	0.4099	M	0.4641	0.4112
	0.4513	0.4164		0.4573	0.4178		0.4634	0.4193		0.4695	0.4207
	0.4573	0.4178		0.4634	0.4193		0.4695	0.4207		0.4756	0.4221
	0.4523	0.4085		0.4582	0.4099		0.4641	0.4112		0.4700	0.4126
N	0.4513	0.4164	P	0.4573	0.4178	Q	0.4634	0.4193	R	0.4695	0.4207
	0.4562	0.4260		0.4624	0.4274		0.4687	0.4289		0.4750	0.4304
	0.4624	0.4274		0.4687	0.4289		0.4750	0.4304		0.4813	0.4319
	0.4573	0.4178		0.4634	0.4193		0.4695	0.4207		0.4756	0.4221

3000K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.4147	0.3814	B	0.4203	0.3833	C	0.4259	0.3853	D	0.4316	0.3873
	0.4183	0.3898		0.4242	0.3919		0.4300	0.3939		0.4359	0.3960
	0.4242	0.3919		0.4300	0.3939		0.4359	0.3960		0.4418	0.3981
	0.4203	0.3833		0.4259	0.3853		0.4316	0.3873		0.4373	0.3893
E	0.4183	0.3898	F	0.4242	0.3919	G	0.4300	0.3939	H	0.4359	0.3960
	0.4221	0.3984		0.4281	0.4006		0.4342	0.4028		0.4403	0.4049
	0.4281	0.4006		0.4342	0.4028		0.4403	0.4049		0.4465	0.4071
	0.4242	0.3919		0.4300	0.3939		0.4359	0.3960		0.4418	0.3981
J	0.4221	0.3984	K	0.4281	0.4006	L	0.4342	0.4028	M	0.4403	0.4049
	0.4259	0.4073		0.4322	0.4096		0.4385	0.4119		0.4449	0.4141
	0.4322	0.4096		0.4385	0.4119		0.4449	0.4141		0.4513	0.4164
	0.4281	0.4006		0.4342	0.4028		0.4403	0.4049		0.4465	0.4071
N	0.4259	0.4073	P	0.4322	0.4096	Q	0.4385	0.4119	R	0.4449	0.4141
	0.4299	0.4165		0.4364	0.4188		0.4430	0.4212		0.4496	0.4236
	0.4364	0.4188		0.4430	0.4212		0.4496	0.4236		0.4562	0.4260
	0.4322	0.4096		0.4385	0.4119		0.4449	0.4141		0.4513	0.4164

Product Bin Definitions

Table 8: Color Bin Definition

3500K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.3889	0.3690	B	0.3953	0.3720	C	0.4017	0.3751	D	0.4082	0.3782
	0.3915	0.3768		0.3981	0.3800		0.4048	0.3832		0.4116	0.3865
	0.3981	0.3800		0.4048	0.3832		0.4116	0.3865		0.4183	0.3898
	0.3953	0.3720		0.4017	0.3751		0.4082	0.3782		0.4147	0.3814
E	0.3915	0.3768	F	0.3981	0.3800	G	0.4048	0.3832	H	0.4116	0.3865
	0.3941	0.3848		0.4010	0.3882		0.4080	0.3916		0.4150	0.3950
	0.4010	0.3882		0.4080	0.3916		0.4150	0.3950		0.4221	0.3984
	0.3981	0.3800		0.4048	0.3832		0.4116	0.3865		0.4183	0.3898
J	0.3941	0.3848	K	0.4010	0.3882	L	0.4080	0.3916	M	0.4150	0.3950
	0.3968	0.3930		0.4040	0.3966		0.4113	0.4001		0.4186	0.4037
	0.4040	0.3966		0.4113	0.4001		0.4186	0.4037		0.4259	0.4073
	0.4010	0.3882		0.4080	0.3916		0.4150	0.3950		0.4221	0.3984
N	0.3968	0.3930	P	0.4040	0.3966	Q	0.4113	0.4001	R	0.4186	0.4037
	0.3996	0.4015		0.4071	0.4052		0.4146	0.4089		0.4222	0.4127
	0.4071	0.4052		0.4146	0.4089		0.4222	0.4127		0.4299	0.4165
	0.4040	0.3966		0.4113	0.4001		0.4186	0.4037		0.4259	0.4073

4000K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.3670	0.3578	B	0.3726	0.3612	C	0.3783	0.3646	D	0.3840	0.3681
	0.3726	0.3612		0.3783	0.3646		0.3840	0.3681		0.3898	0.3716
	0.3744	0.3685		0.3804	0.3721		0.3863	0.3758		0.3924	0.3794
	0.3686	0.3649		0.3744	0.3685		0.3804	0.3721		0.3863	0.3758
E	0.3686	0.3649	F	0.3744	0.3685	G	0.3804	0.3721	H	0.3863	0.3758
	0.3744	0.3685		0.3804	0.3721		0.3863	0.3758		0.3924	0.3794
	0.3763	0.3760		0.3825	0.3798		0.3887	0.3836		0.3950	0.3875
	0.3702	0.3722		0.3763	0.3760		0.3825	0.3798		0.3887	0.3836
J	0.3702	0.3722	K	0.3763	0.3760	L	0.3825	0.3798	M	0.3887	0.3837
	0.3763	0.3760		0.3825	0.3798		0.3887	0.3836		0.3950	0.3875
	0.3782	0.3837		0.3847	0.3877		0.3912	0.3917		0.3978	0.3958
	0.3719	0.3797		0.3782	0.3837		0.3847	0.3877		0.3912	0.3917
N	0.3719	0.3797	P	0.3782	0.3837	Q	0.3847	0.3877	R	0.3912	0.3917
	0.3782	0.3837		0.3847	0.3877		0.3912	0.3917		0.3978	0.3958
	0.3802	0.3916		0.3869	0.3958		0.3937	0.4001		0.4006	0.4044
	0.3736	0.3874		0.3802	0.3916		0.3869	0.3958		0.3937	0.4001

5000K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.3371	0.3490	B	0.3451	0.3554	C	0.3376	0.3616	D	0.3463	0.3687
	0.3451	0.3554		0.3533	0.3620		0.3463	0.3687		0.3551	0.3760
	0.3440	0.3427		0.3515	0.3487		0.3451	0.3554		0.3533	0.3620
	0.3366	0.3369		0.3440	0.3427		0.3371	0.3490		0.3451	0.3554

5700K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.3215	0.3350	B	0.3290	0.3417	C	0.3207	0.3462	D	0.3290	0.3538
	0.3290	0.3417		0.3371	0.3490		0.3290	0.3538		0.3376	0.3616
	0.3290	0.3300		0.3366	0.3369		0.3290	0.3417		0.3371	0.3490
	0.3222	0.3243		0.3290	0.3300		0.3215	0.3350		0.3290	0.3417

Product Bin Definitions

Table 8: Color Bin Definition

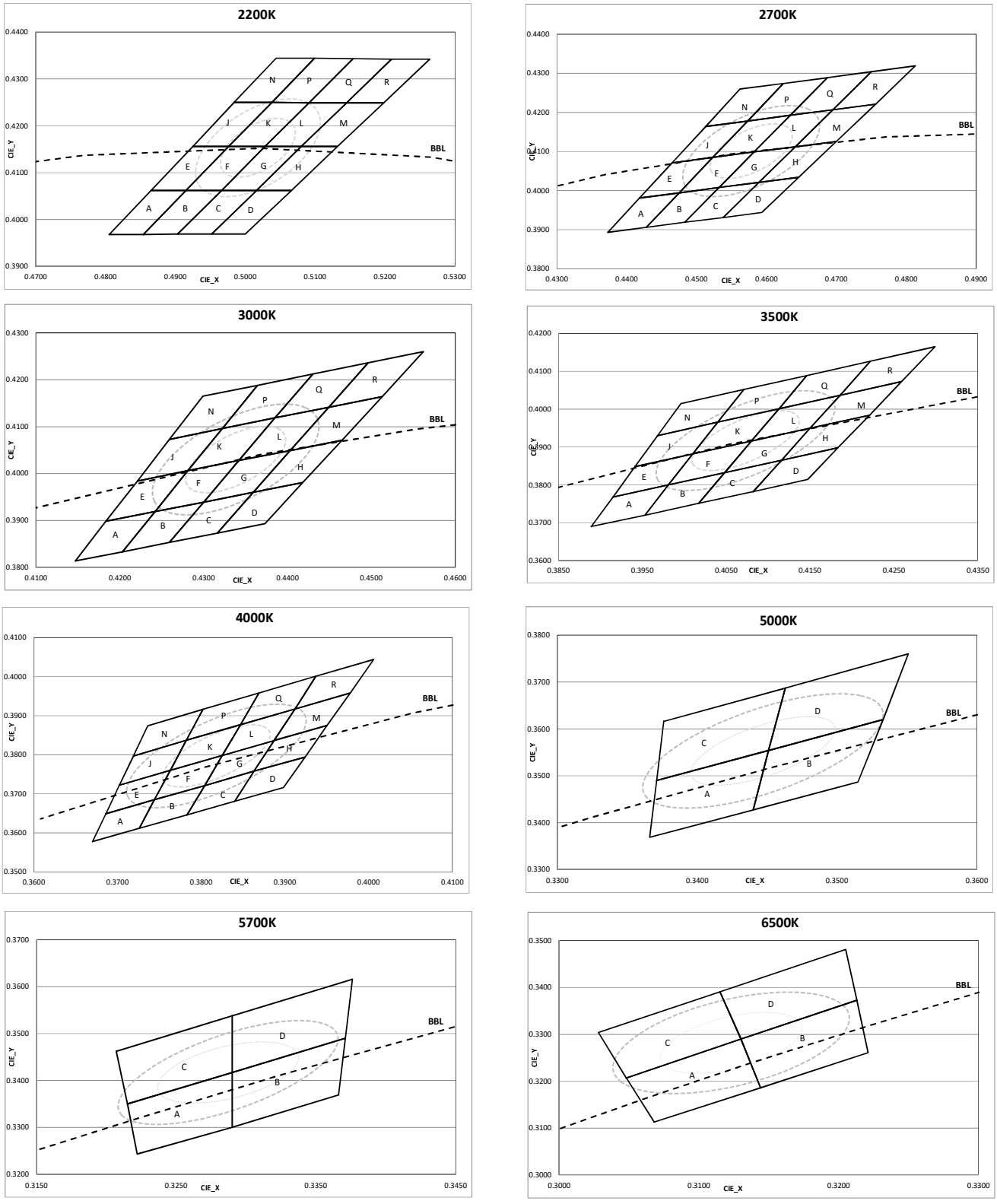
6500K Bins											
Region	CIE x	CIE y	Region	CIEx	CIE y	Region	CIE x	CIE y	Region	CIEx	CIE y
A	0.3068	0.3113	B	0.3144	0.3186	C	0.3048	0.3207	D	0.3130	0.3290
	0.3144	0.3186		0.3221	0.3261		0.3130	0.3290		0.3213	0.3373
	0.3130	0.3290		0.3213	0.3373		0.3115	0.3391		0.3205	0.3481
	0.3048	0.3207		0.3130	0.3290		0.3028	0.3304		0.3115	0.3391

Note for Table 8:

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

Product Bin Definitions

Figure 1: C.I.E. 1931 Chromaticity Diagram (16 or 4 Color Bin Structure, Hot-color Targeted at T_{sp}=85°C)



Performance Curves

Figure 2: Drive Current vs. Forward Voltage (T_{sp}=85°C)

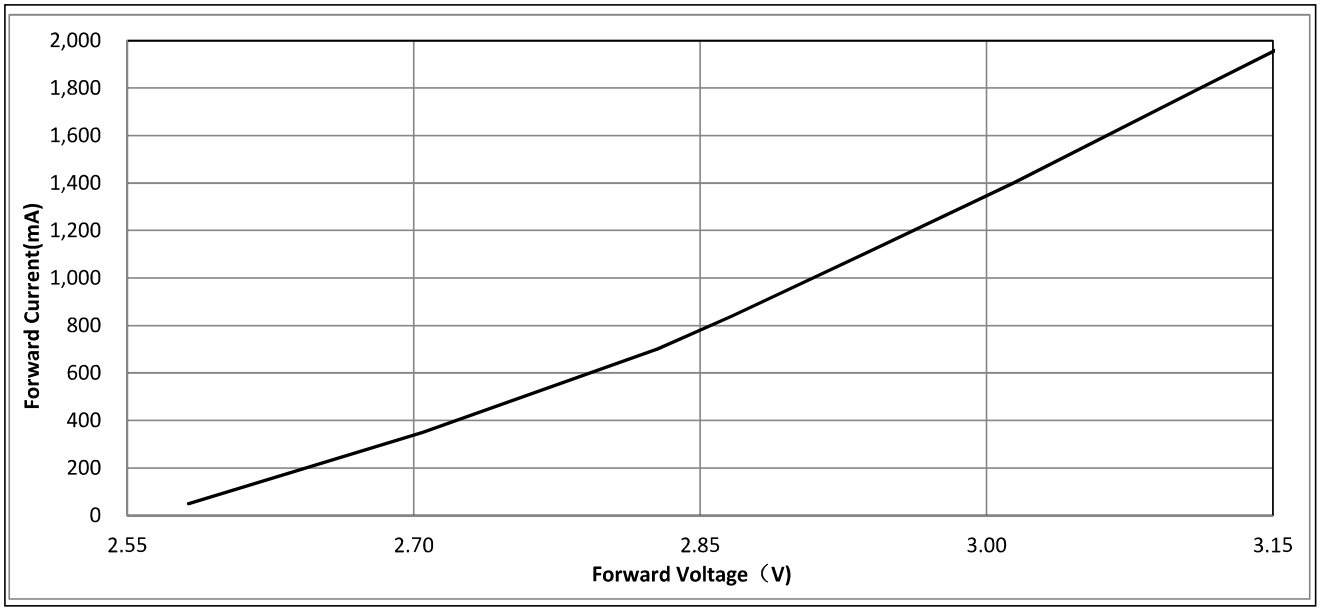
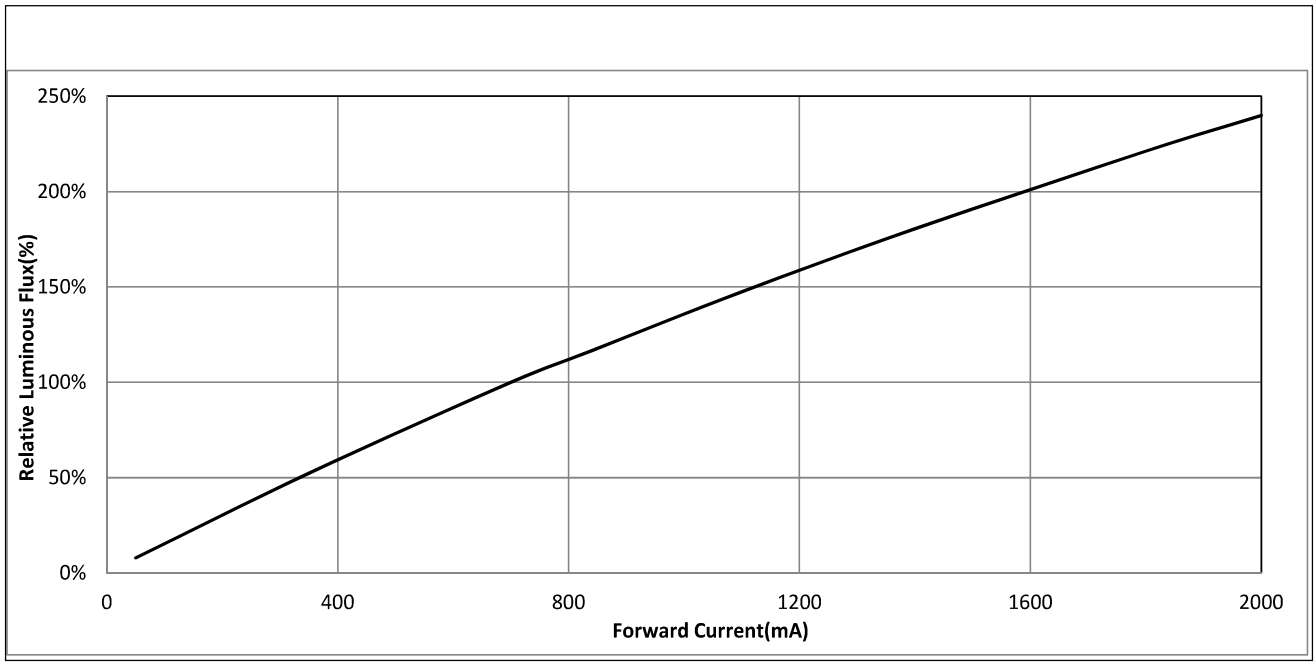


Figure 3: Relative Luminous Flux vs. Drive Current (T_{sp}=85°C)



Note for Figure 3:

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

Performance Curves

Figure 4: Relative Flux vs. Solder Point Temperature_700mA

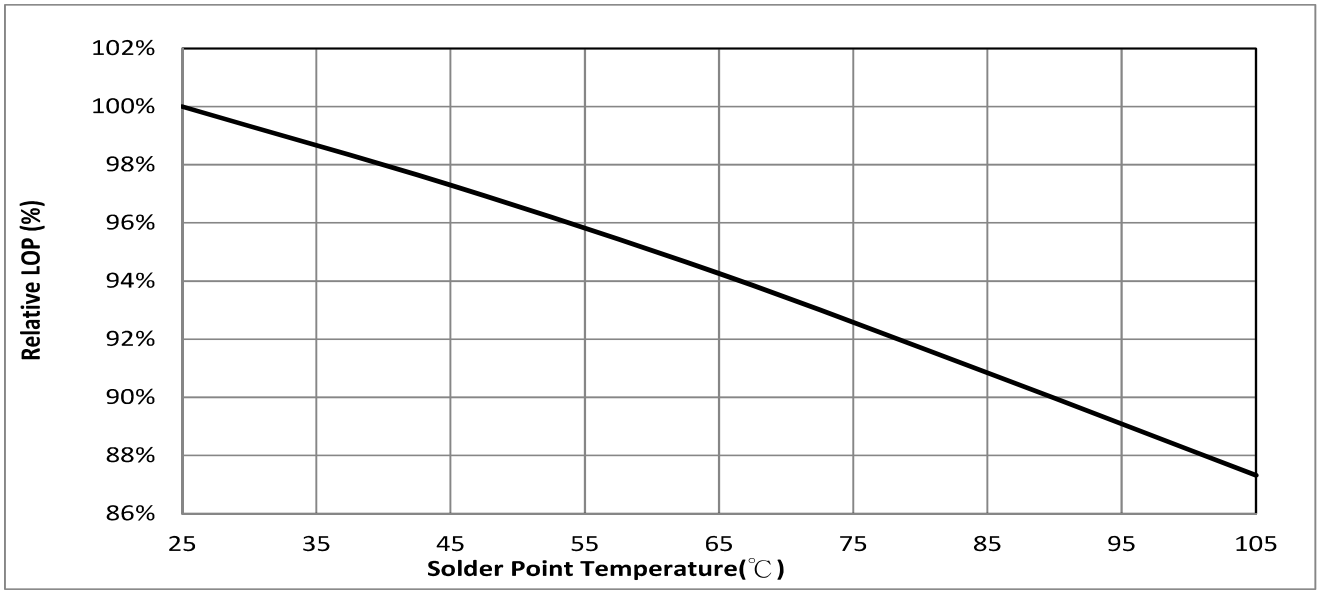
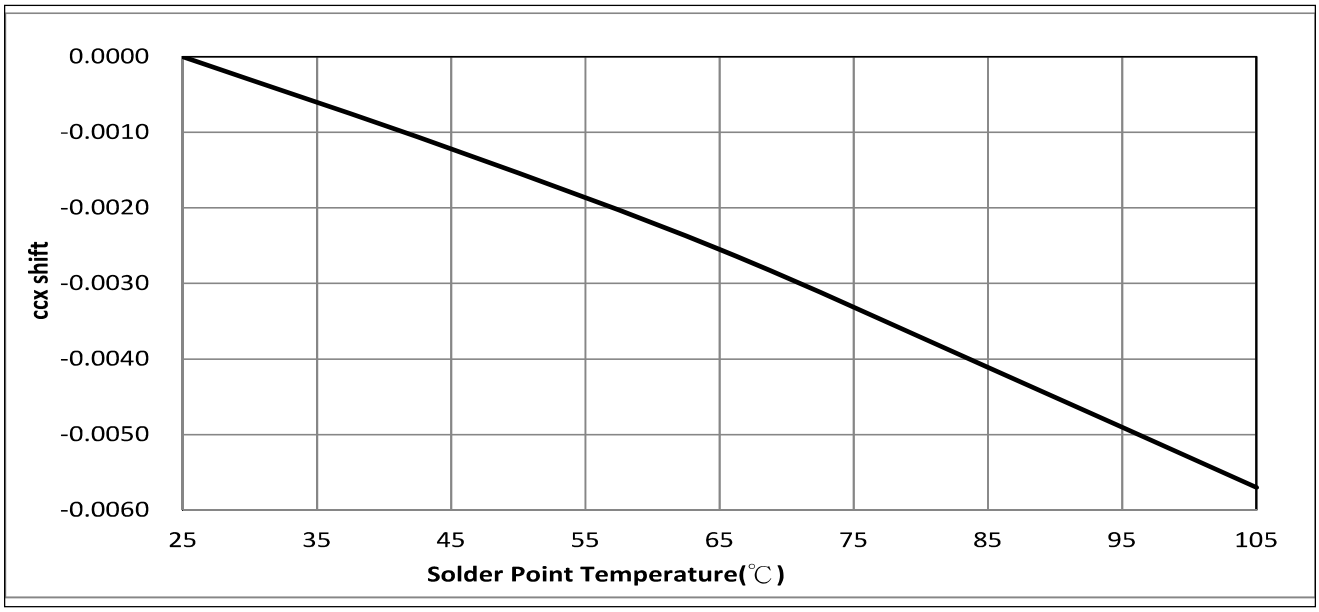


Figure 5: Typical CCX Shift vs. Solder Point Temperature_700mA

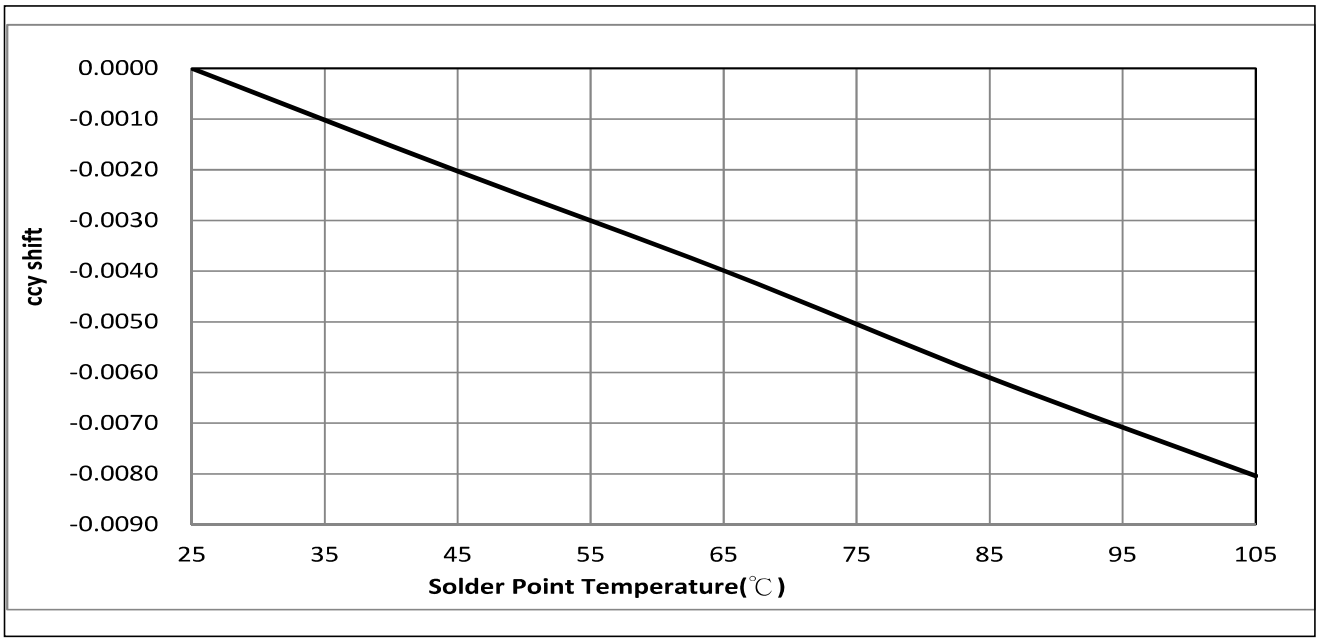


Notes for Figures 4 & 5:

1. Characteristics shown for cool white based on 5000K 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

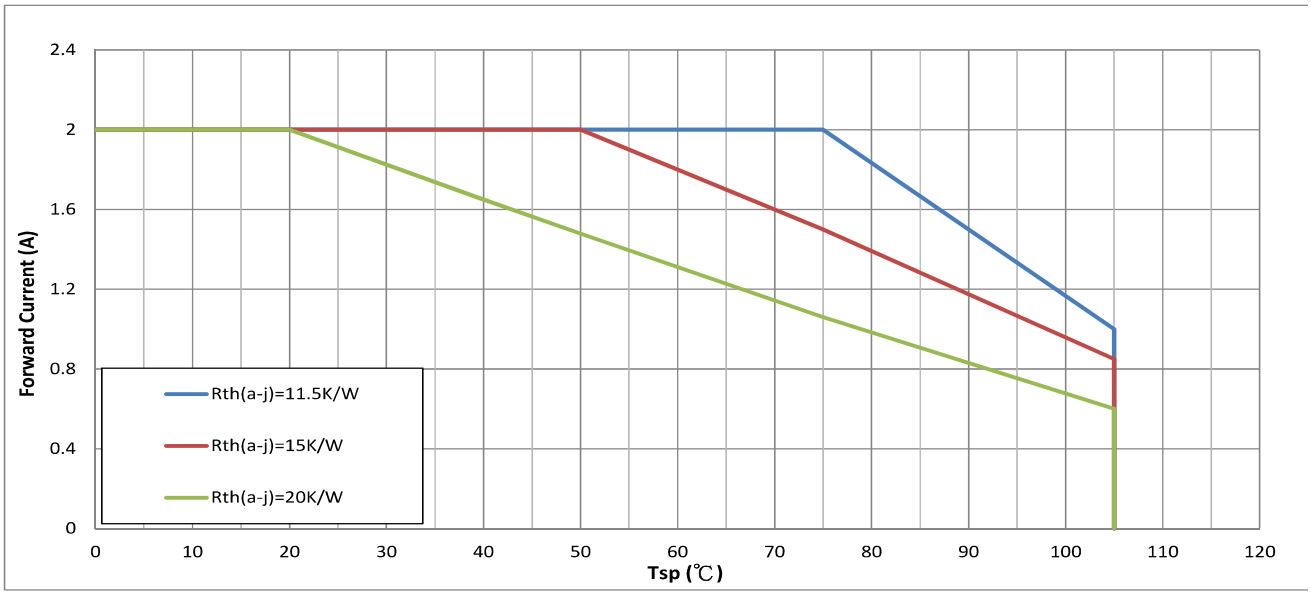
Figure 6: Typical CCY Shift vs. Solder Point Temperature_700mA



Notes for Figure 6:

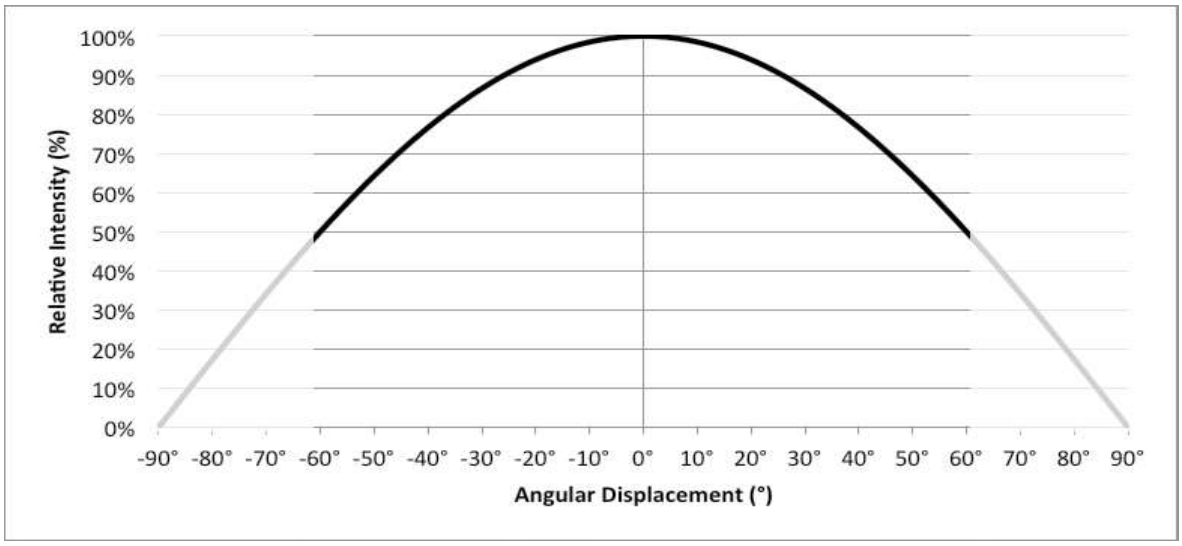
1. Characteristics shown for cool white based on 5000K and 70 CRI.
2. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information

Figure 7: Drive Current vs Solder Point Temperature



Typical Radiation Pattern

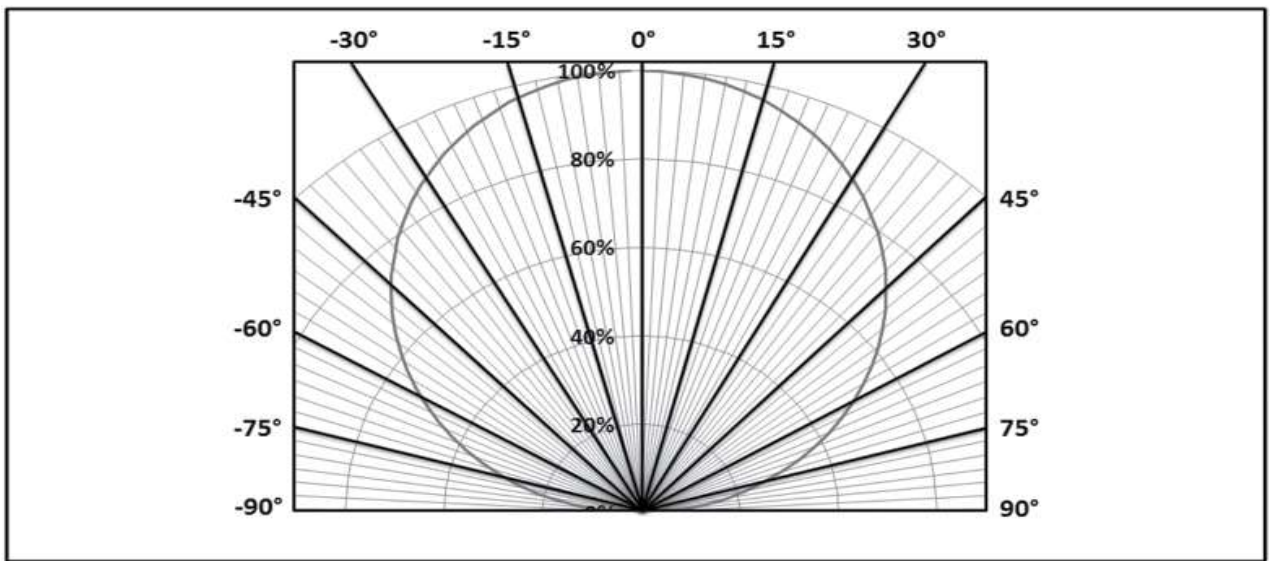
Figure 8: Typical Spatial Radiation Pattern at 700mA, T_{sp}=25˚C



Notes for Figure 8:

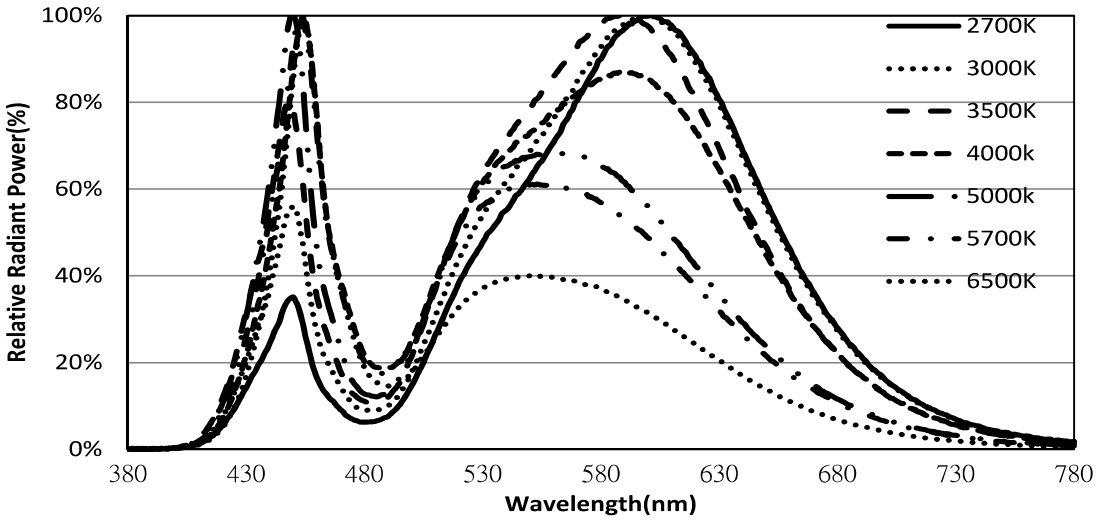
1. Typical viewing angle is 120˚.
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (Iv) is ½ of the peak value.

Figure 9: Typical Polar Radiation Pattern at 700mA, T_{sp}=25˚C



Typical Color Spectrum

Figure 10: Typical Color Spectrum

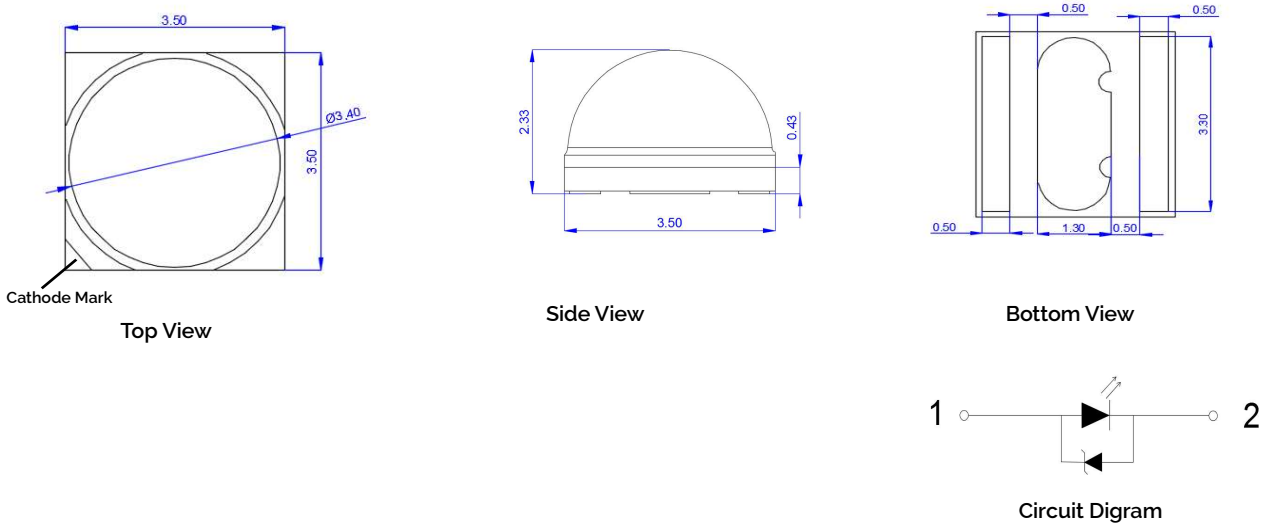


Notes for Figure 10:

1. Color spectra measured at nominal current for Tsp = 85°C
2. Color spectra shown for 70 CRI products.

Mechanical Dimensions

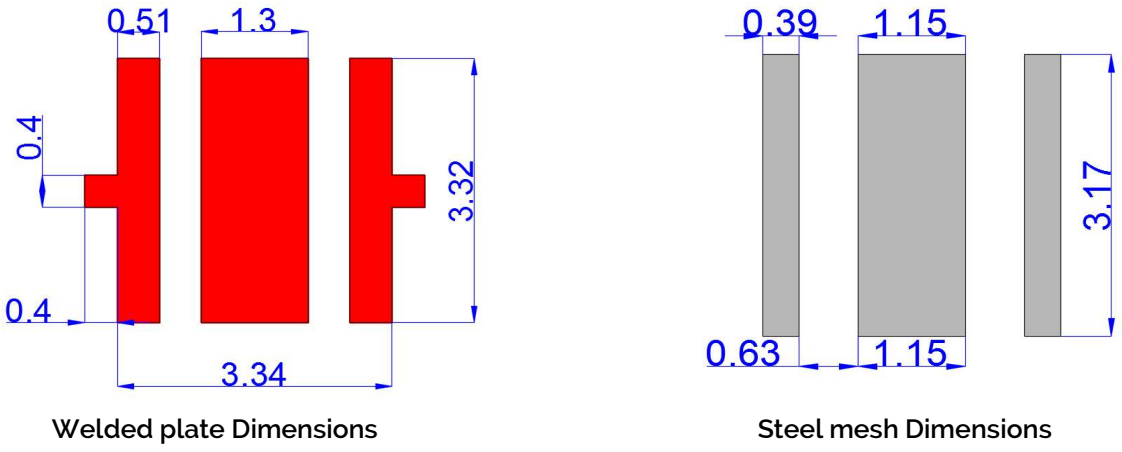
Figure 11: Drawing for SMD 3535



Notes for Figure 11:

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

Welded plate and steel mesh Dimensions



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: 85°C, 60%RH, 168hr		3 reflows	0/20
2	Low Temperature Storage	JESD22-A119	T_a=-40°C		1000 hours	0/20
3	High Temperature Storage	JESD22-A103D	T_a=105°C		1000 hours	0/20
4	Low Temperature Operating Life	JESD22-A108D	T_a=-40°C	2000mA	1000 hours	0/20
5	Temperature Humidity Operating Life	JESD22-A101C	T_{sp}=85°C, RH=85%	1000mA	1000 hours	0/20
6	High Temperature Operating Life	JESD22-A108D	T_{sp}=85°C	2000mA	1000 hours	0/20
7	Thermal Shock	JESD22-A106B	T_a=-40°C ~125°C; Dwell : 15min; Transfer: 10sec		200 Cycle	0/20
8	Temperature Cycle	JESD22-A104E	T_a=-40°C ~100°C; Dwell at extreme temperature: 15min; Ramp rate < 105°C/min		200 Cycle	0/20
9	Electrostatic Discharge	JS-001-2012	HBM, 8KV, 1.5kΩ, 100pF, Alternately positive or negative		pass	0/20

Passing Criteria

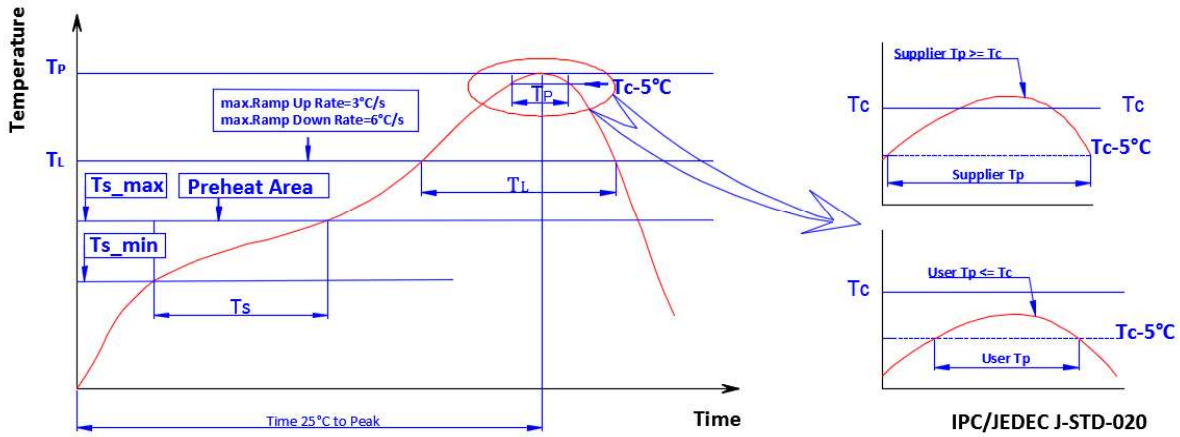
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	700mA	ΔVf<10%
Luminous Flux	Fv	700mA	ΔFv<30%
Chromaticity Coordinates	(x, y)	700mA	Δu'v'<0.007

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

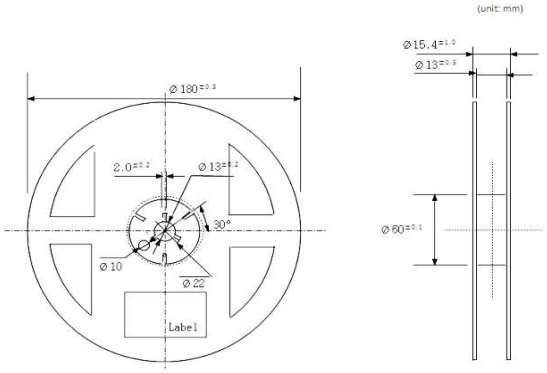
Figure 12 : Reflow Profile



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

Packaging

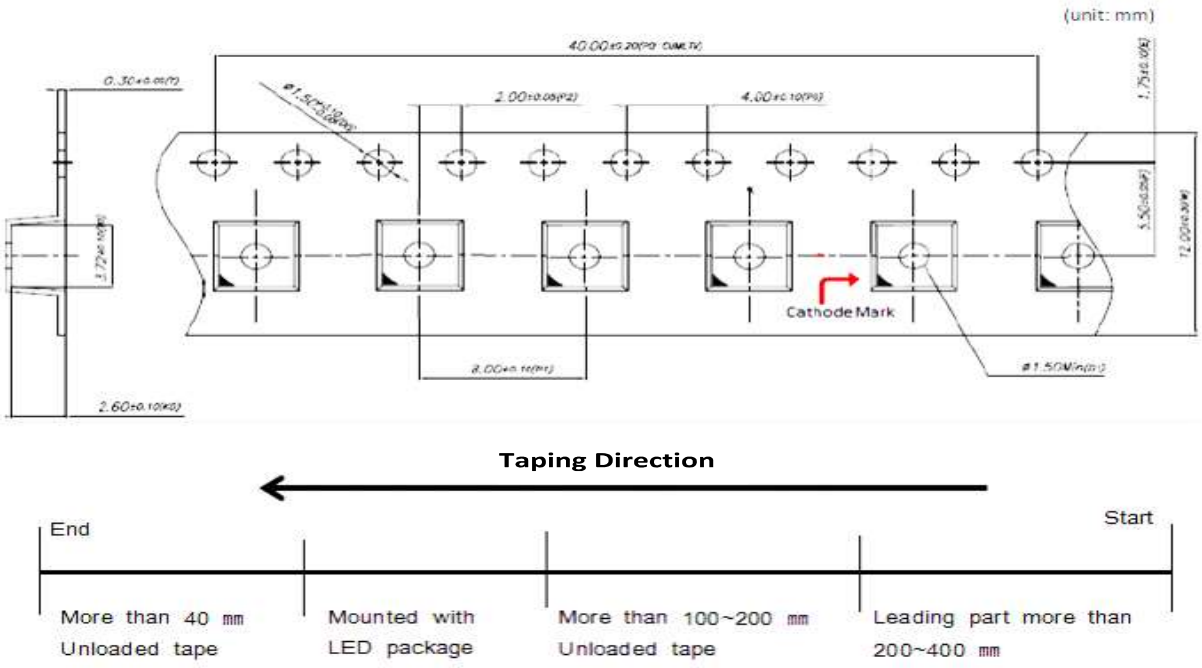
Figure 13: Emitter Reel Drawings



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

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.

For more information about the company, please visit
bridgelux.com
twitter.com/Bridgelux
facebook.com/Bridgelux
WeChat ID: BridgeluxInChina

46410 Fremont Boulevard
Fremont, CA 94538 U.S.A.
Tel (925) 583-8400
www.bridgelux.com