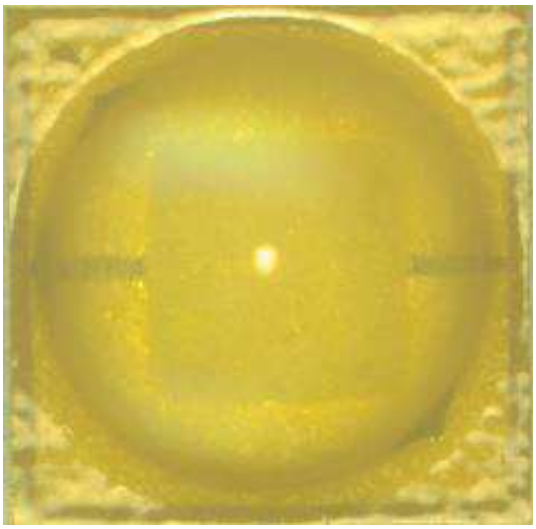
SEHP35 LED Package of Specifications

Product : SEHP35

Version : D

Date : 2023/08/01

SEHP35



Product Features & Applications

- High efficacy for cost effective solutions
- High quality lighting solution
- Industry-leading thermal resistance
- Excellent lumen maintenance requirements
- MSL2
- Outdoor lighting
- Indoor Lighting
- Downlight
- Spotlight
- Automotive Light
- Street Light

Product Specification

CCT	CRI	Typical Flux (lm)			
		350mA @25°C	350mA @85°C	700mA @85°C	1000mA @85°C
3000K	70	162	149	280	379
	80	152	139	265	359
4000K	70	166	152	286	387
	80	158	144	275	374
5000K	70	172	158	297	403
	80	166	153	287	387
5700K	70	171	157	295	400
	80	164	151	282	382
6500K	70	170	157	294	398
	80	163	150	281	380

Notes:

1. The viewing angle is 50% center light intensity angle, Optical simulation software light source data of ProSource\Lighttools\TrasePro\ASAP\Zemax etc can be provided;

2. ETI maintains a testing tolerance of ± 7% on flux and power measurements, ±0.007 on chromaticity (CCx, CCy), ±3 on CRI measurements, Voltage, ± 0.1V on voltage testing

	350mA @25°C	350mA @85°C	700mA @85°C	1000mA @85°C
Forward Voltage (Vf)	2.77V	2.71V	2.81V	2.89V

Absolute Maximum Ratings

Item	Symbol	Absolute Maximum Rating
Junction Temperature (°C)	Tj	150°
Operating Temperature (°C)	Top	-40°C - 120°C
Storage Temperature (°C)	Tstg	-40°C - 120°C
Forward Current	IF	1500mA
Pulse Forward Current	IFM	2000mA
Reverse Voltage	VR	No Reverse Operation Design
Electrostatic Disharge	ESD (HBM)	8000V

Notes:

1. Maximum Forward Current and Maximum Pulse Current require the junction temperature to be lower then the rated junction temperature;
2. IFM condition Pulse width at 50ms and duty cycle at 0.016;
3. Bilt-in ESD protection diode.

Electrical, optical, thermal characteristics

Item	Symbol	Value	
Forward Voltage (V)	Vf	Typ. @350mA	Max. @350mA
		2.75V	2.95V
Typical Viewing Angle (°)	-	120°	
Typical Termal Resistance (°C/W)	Rth(Tj-s)	5.5 °C/W	

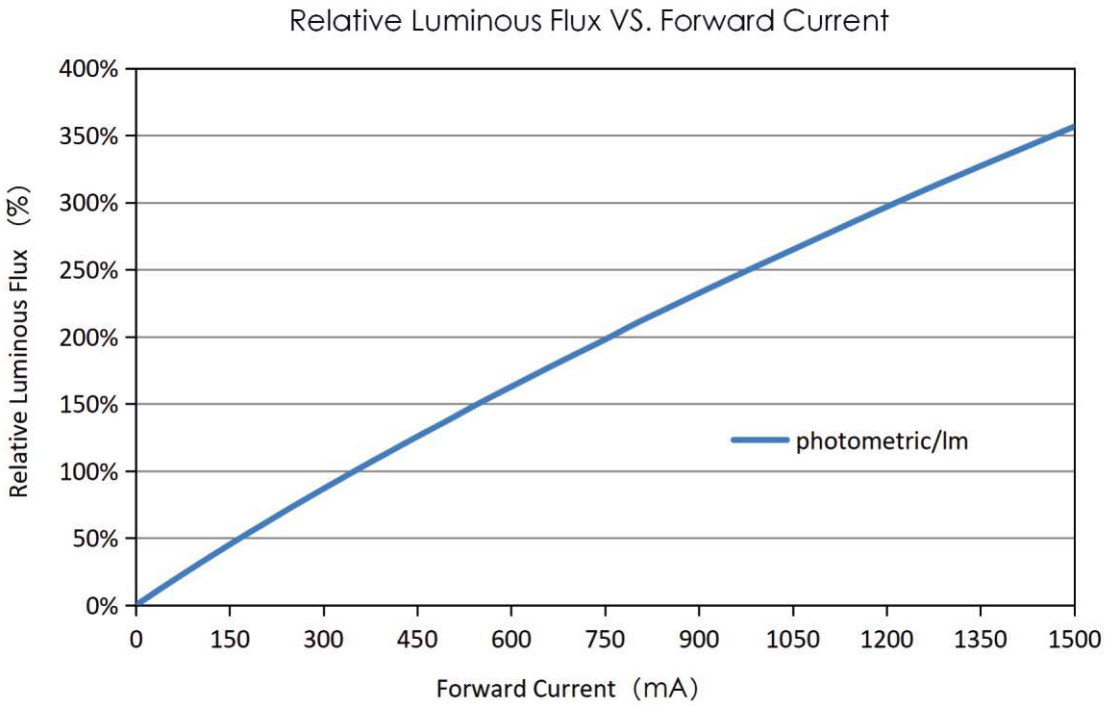
Luminanse comparison between @ 25°C and @ 85°C

CCT	Luminance range (lm) @25°C		Luminance range (lm) @85°C	
2200K ~ 6500K	S	156 - 164	Q	139 - 148
	T	164 - 172	R	148 - 156
	U	172 - 182	S	156 - 164
	V	182 - 192	T	164 - 172
	W	192 - 205	U	172 - 182
	X	205 - 220	V	182 - 192

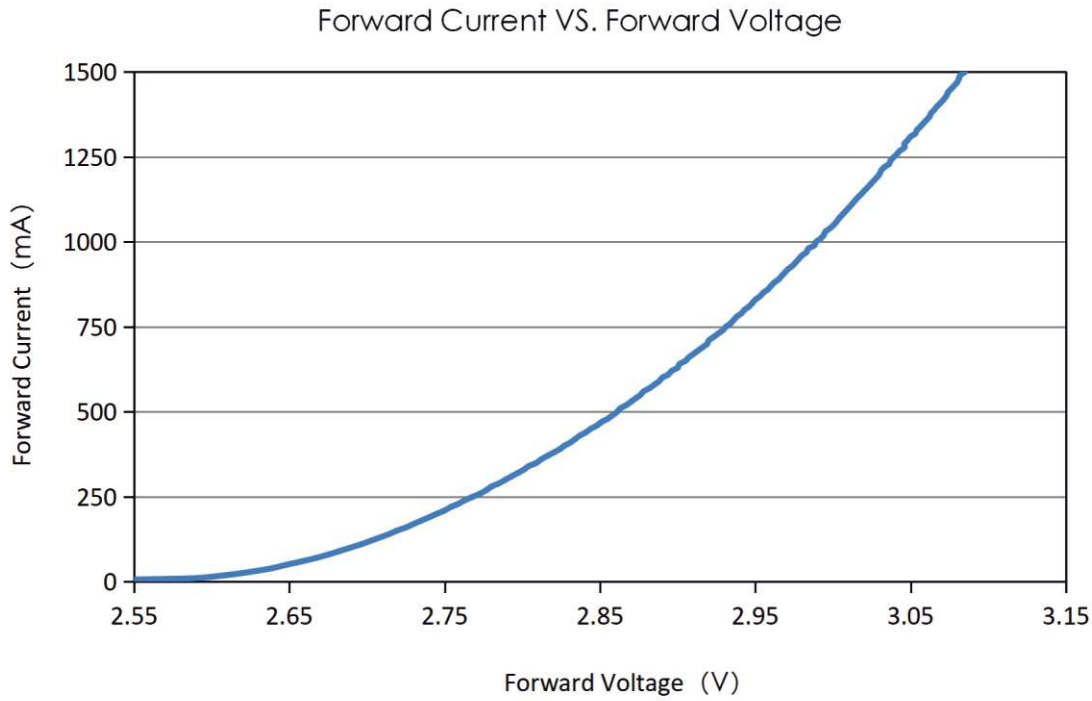
The color coordinate difference in value between @ 25°C and @ 85°C

CCT	ΔX	ΔY	ΔTc (K)
2200K	<0.002	<0.002	<50
2700K	<0.002	<0.002	<50
3000K	<0.003	<0.004	<50
4000K	<0.004	<0.005	<50
5000K	<0.002	<0.003	<100
5700K	<0.002	<0.002	<100
6500K	<0.003	<0.004	<150

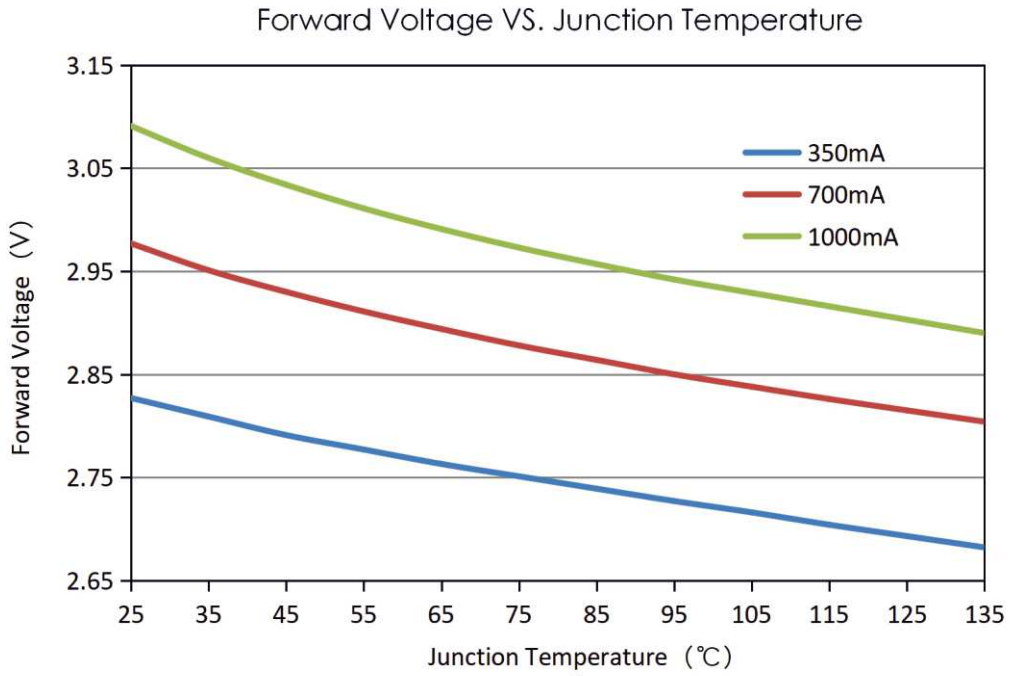
Product Characteristic Curve



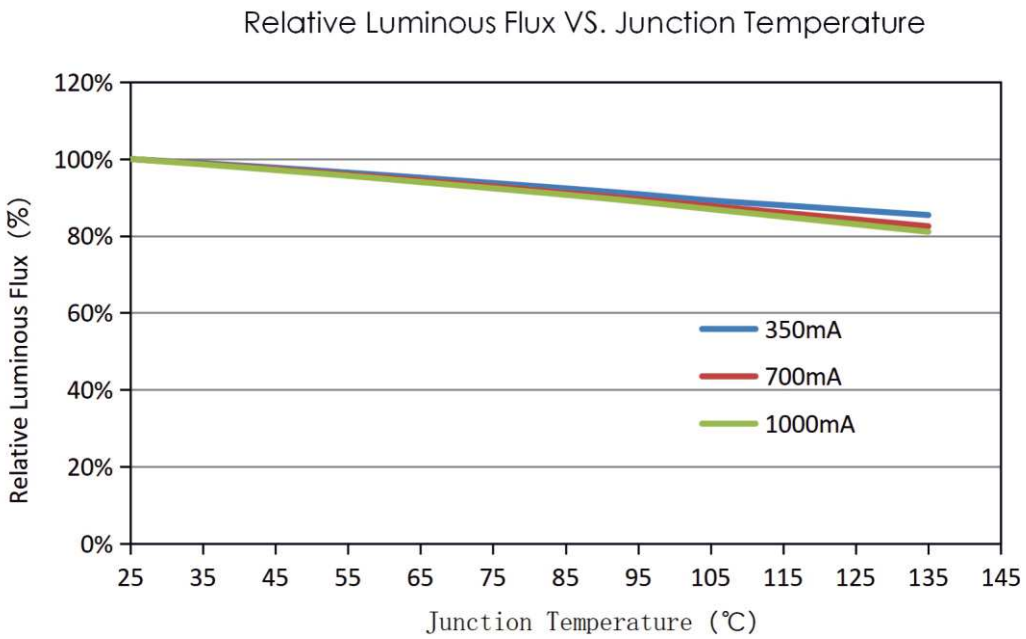
Product Characteristic Curve



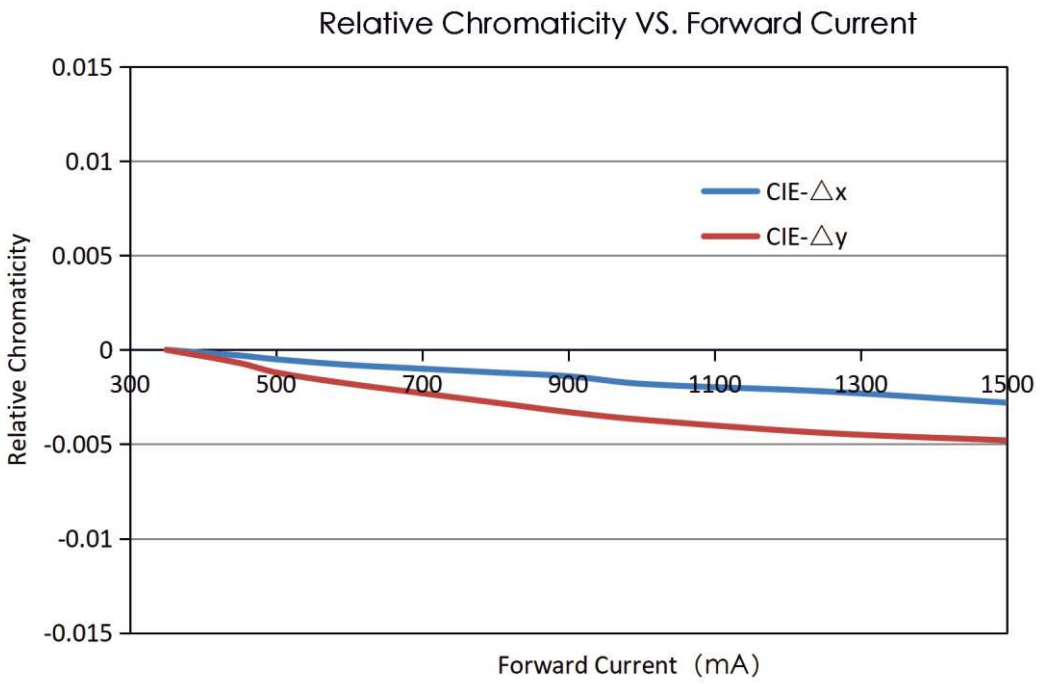
Product Characteristic Curve



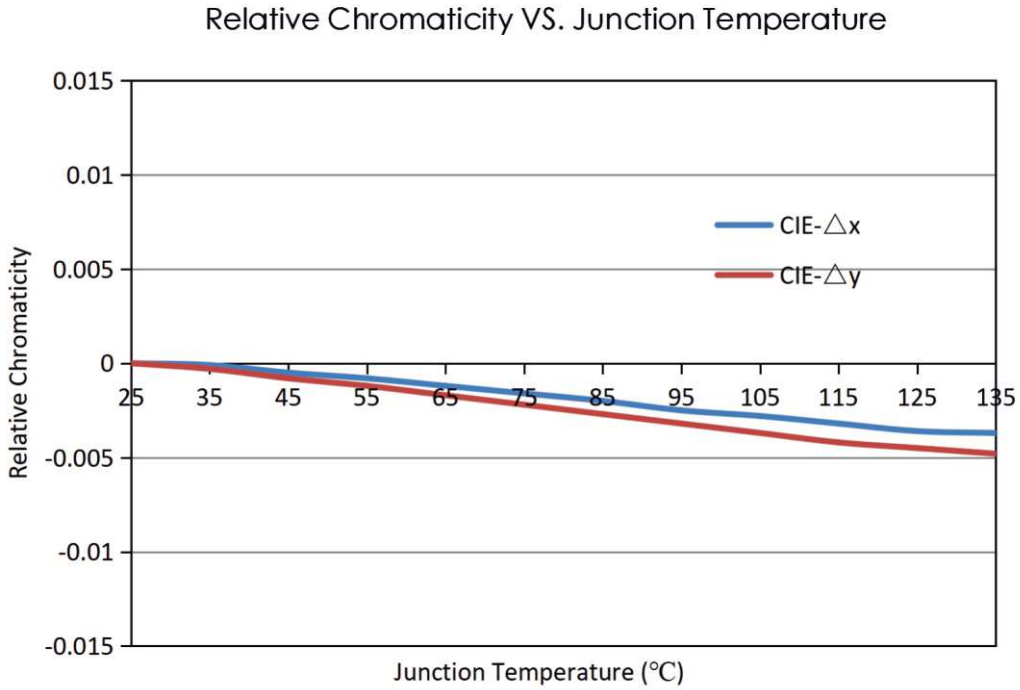
Product Characteristic Curve



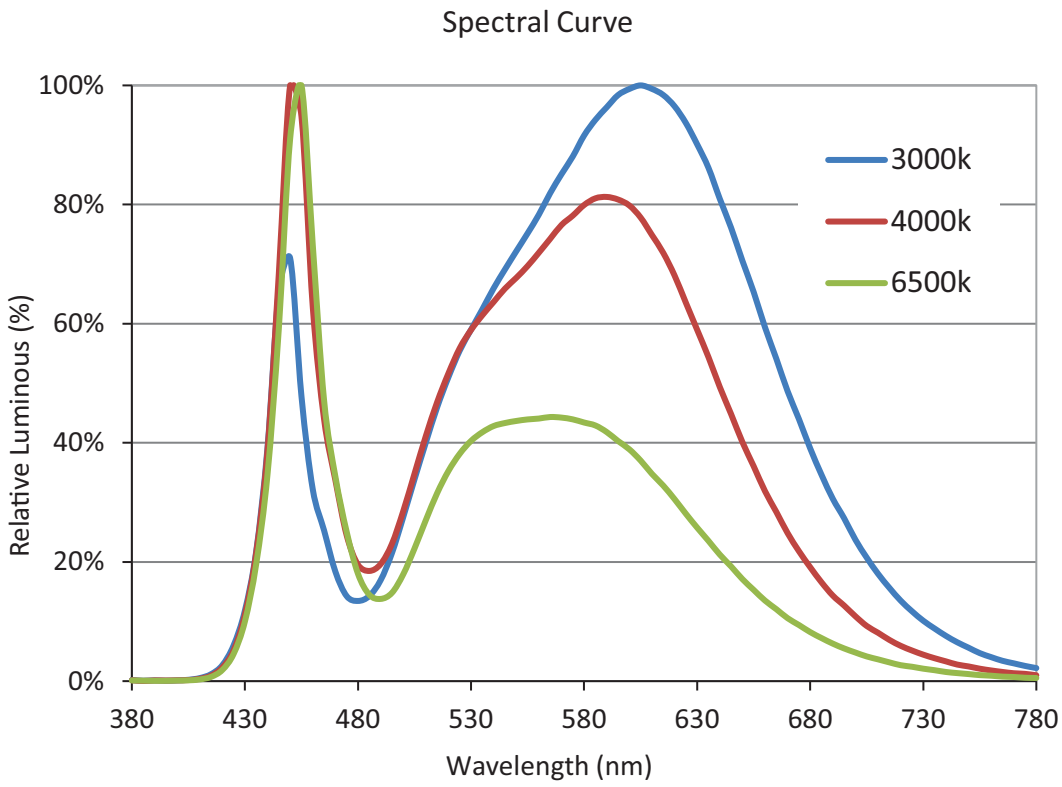
Product Characteristic Curve



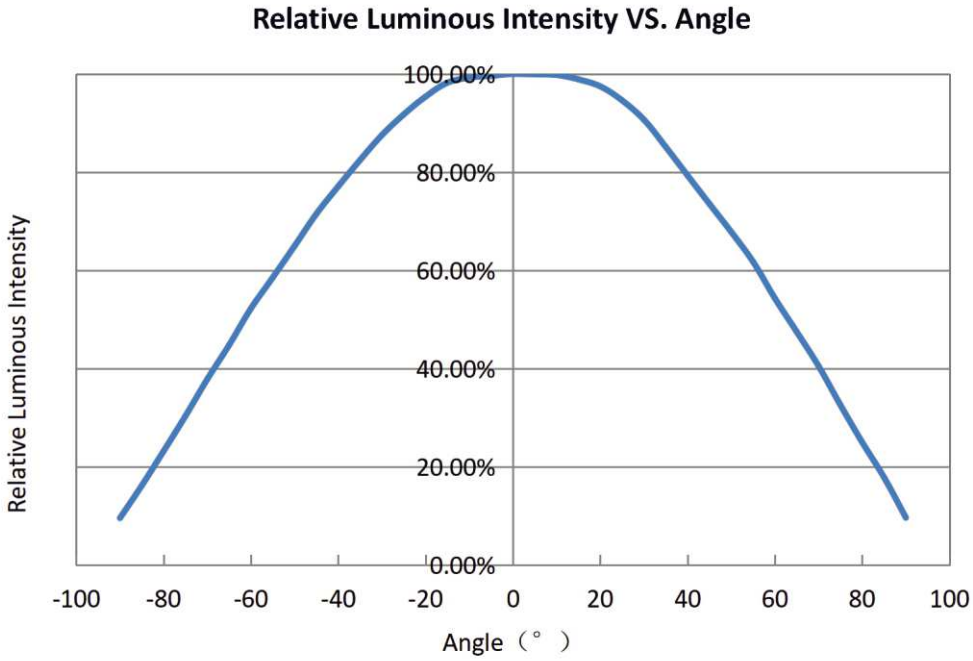
Product Characteristic Curve



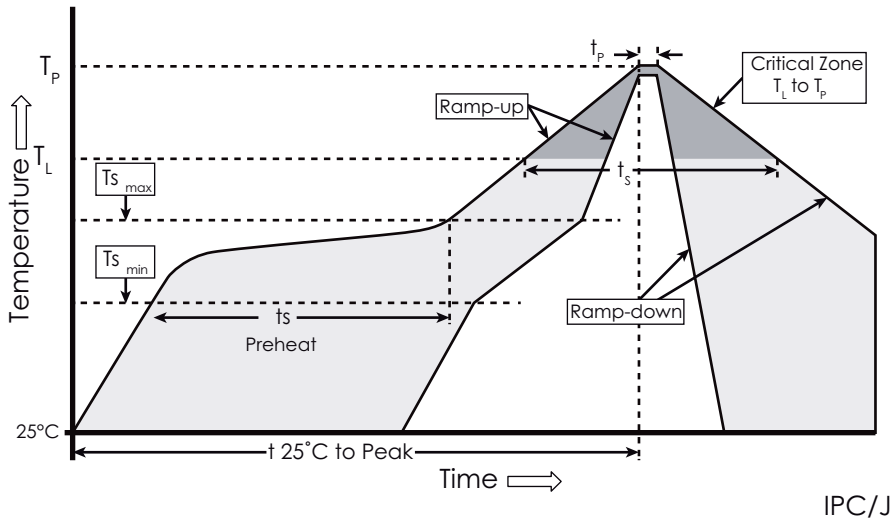
Product Characteristic Curve



Product Characteristic Curve



Recommended Reflow Profile



IPC/JEDECJ-STD-020C

Profile Feature	Lead-Based Solder	Lead-Free Solder
Average Ramp-Up Rate (Ts max to Tp)	3°C/s Max	3°C/s Max
Preheat: Temperature Min (Ts min)	100°C	150°C
Preheat: Temperature Max (Ts max)	150°C	200°C
Preheat Time (Ts min to Ts max)	60-120s	60-180s
Time Maintain Above: Temperature (TL)	183°C	217°
Time Maintain Above: Time (tL)	60-150s	60-150s
Peak/Classification Temperature (Tp)	215°C	260°C
Time within 5°C of Peak Temperature (tP)	10-30s	20-40s
Ramp-Down (Tp to TL)	6°C/s Max	6°C/s Max
Time 25°C to peak Temperature	6 min Max	8 min Max

Notes:

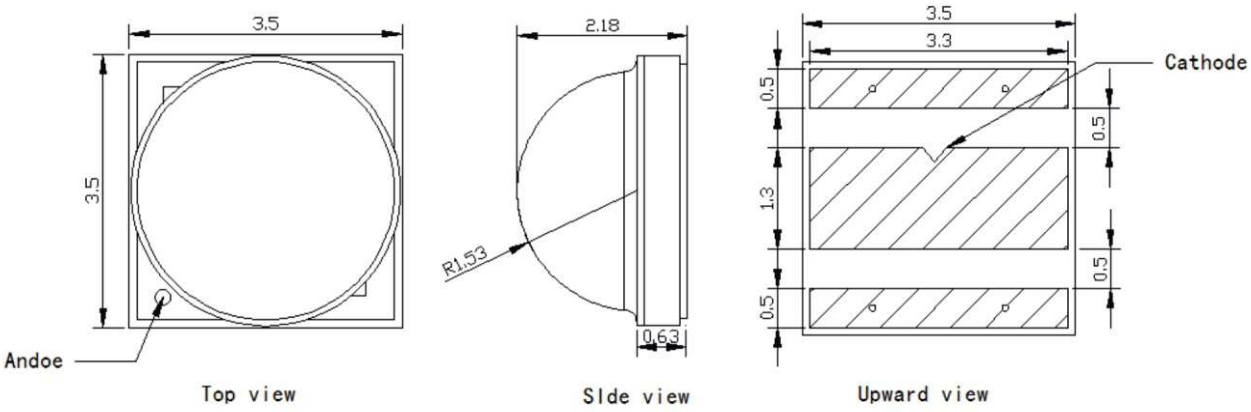
1. The soldering condition refers to J-STD-020D.
2. MSL = 2.

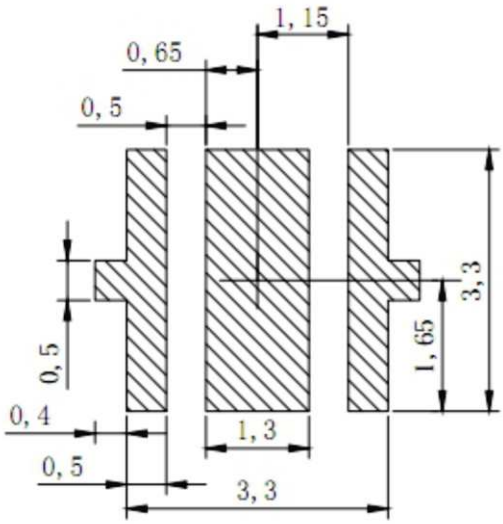
Moisture sensitivity level

After tests confirmed in no more than 30°C under the condition of 85% relative humidity (RH), ETi NLW LED the plant life is not restricted. Moisture determinationis included in the 85°C/ 85% relative humidity under the condition of moisture absorption first 168 hours, then 3 times of reflow soldering, and visual inspection and electrical inspections at each stage. ETi advice: before used immediately, will be kept in a sealed moisture-proof bag NLW LED. ETi also suggested: immediately after use will all unused LED back to seal moisture bag and sealing the bag.

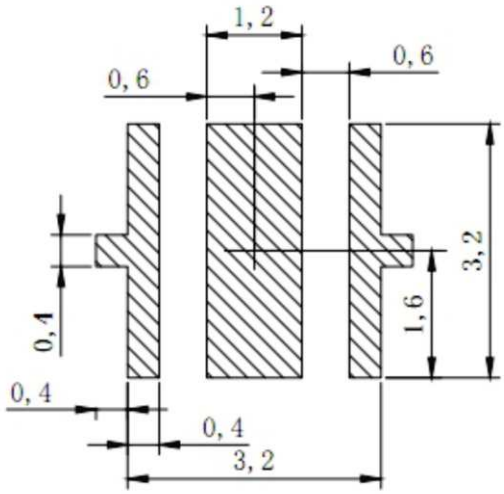
Mechanical Dimensions:

Unit: mm Tolerance: ±0.1



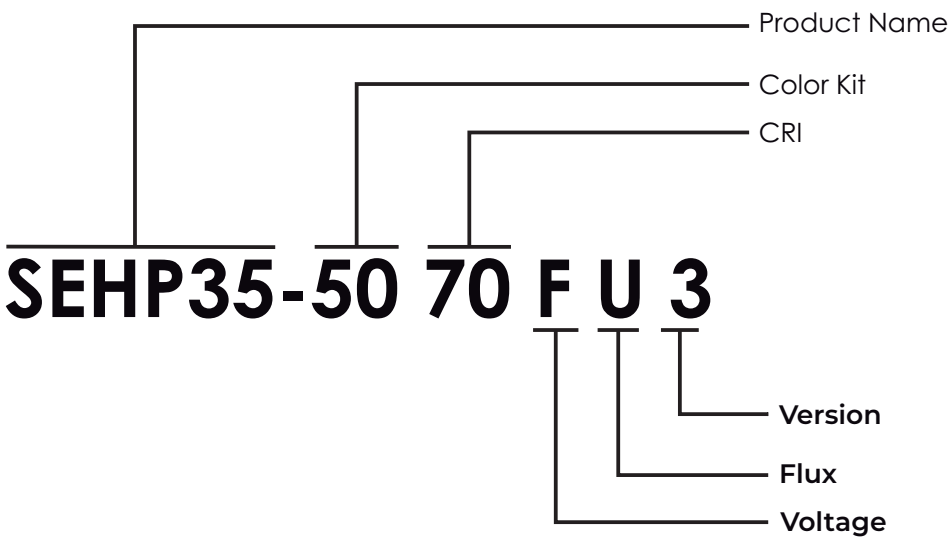


Recommended PCB Solder PAD



Recommended Stencil Pattern

Product Name Description:



Color Kit

Color Kit	CCT
22	2200K
27	2700K
30	3000K
35	3500K
40	4000K
45	4500K
50	5000K
57	5700K
65	6500K

CRI Specification

CRI	Specification
70	CRI70
80	CRI80

Voltage Spesification

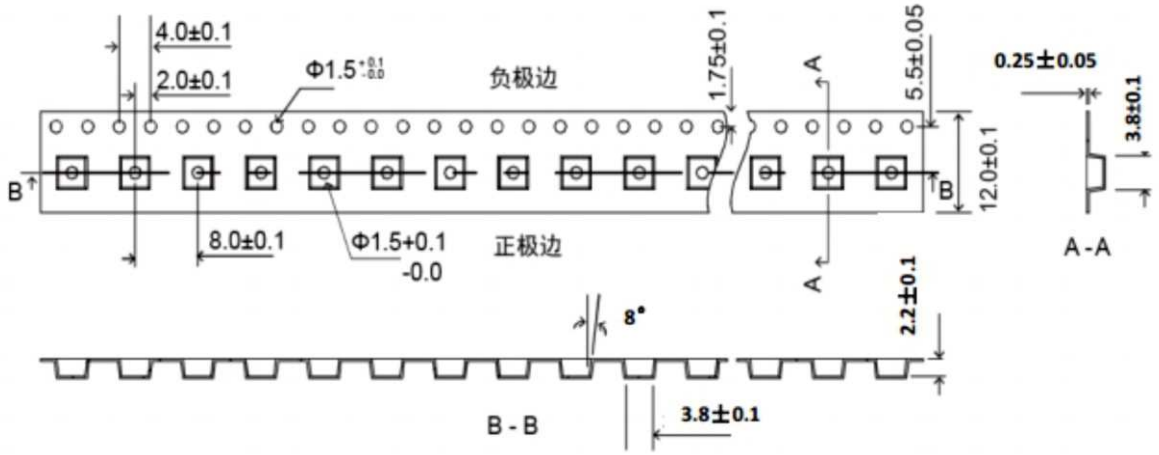
Voltage	Min	Max	Unit
F	2.75	2.95	V

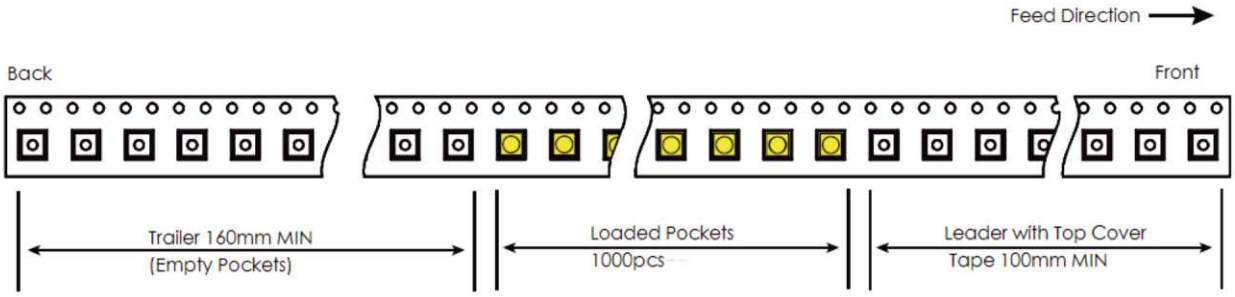
Flux Spesification (@ 25°C)

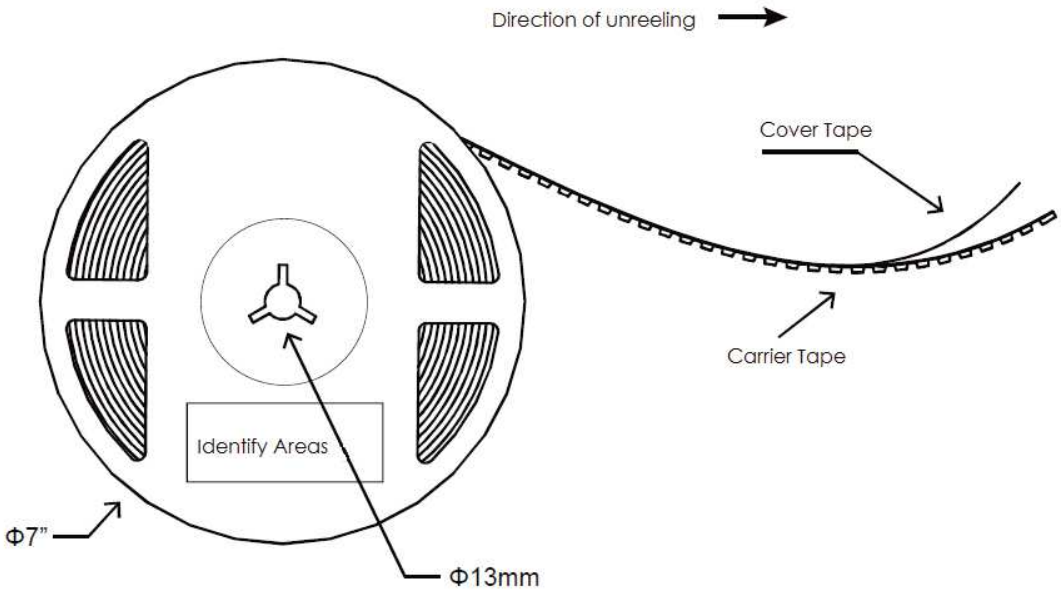
Flux	Min	Max	Unit
K	93.9	100	Lm
L	100	107	Lm
M	107	114	Lm
N	114	122	Lm
O	122	130	Lm
P	130	139	Lm
Q	139	148	Lm
R	148	156	Lm
S	156	164	Lm
T	164	172	Lm
U	172	182	Lm
V	182	192	Lm
W	192	205	Lm
X	205	220	Lm

Tape: Unit: mm (1000pcs)

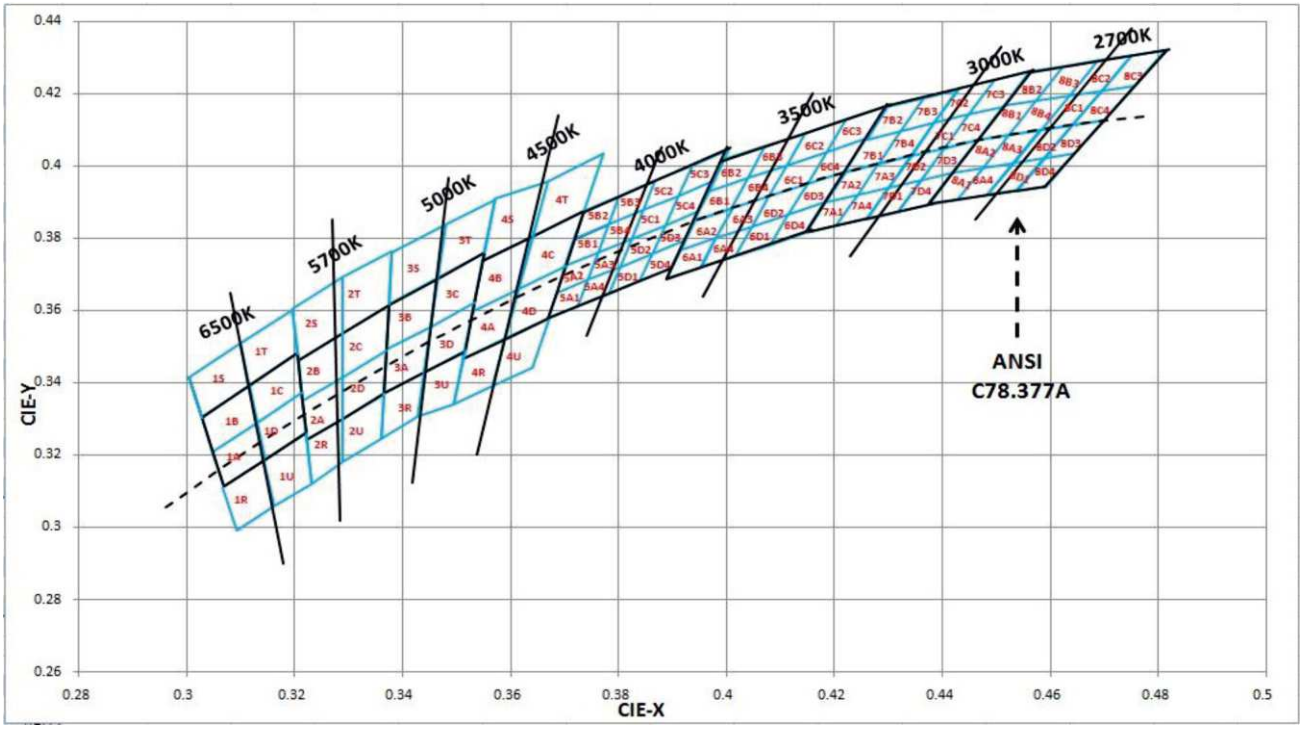
Standard Quantity : 1000 pcs , Min Quantity : 100 pcs , All dimensions in mm, Tolerance : ±0.1

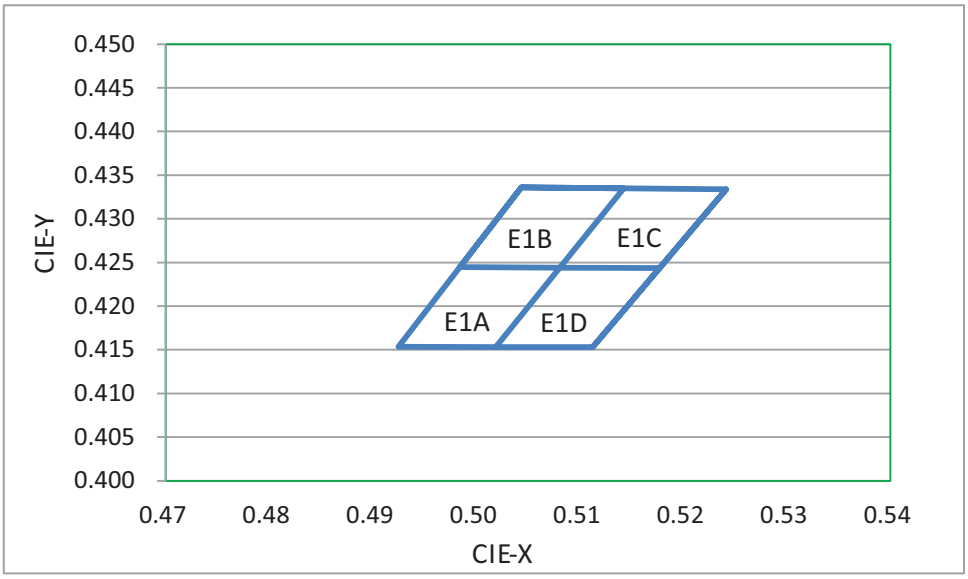






Color Group Description:





- Tolerance: ±0.007 on cromaticity (CCx, CCy)
- Forward Current: 350 mA
- Test Time: 20ms
- Ambient Temperature: 25°C

Performance Groups - Cromaticity

Region	x	y	Region	x	y	Region	x	y	Region	x	y
1A	0.3048	0.3207	1B	0.3028	0.3304	1C	0.3115	0.3391	1D	0.3130	0.3290
	0.3130	0.3290		0.3115	0.3391		0.3205	0.3481		0.3213	0.3373
	0.3144	0.3186		0.3130	0.3290		0.3213	0.3373		0.3221	0.3261
	0.3068	0.3113		0.3048	0.3207		0.3130	0.3290		0.3144	0.3186
1R	0.3068	0.3113	1S	0.3005	0.3415	1T	0.3099	0.3509	1U	0.3144	0.3186
	0.3144	0.3186		0.3099	0.3415		0.3196	0.3602		0.3221	0.3261
	0.3161	0.3059		0.3099	0.3509		0.3205	0.3481		0.3231	0.3120
	0.3093	0.2993		0.3028	0.3304		0.3115	0.3391		0.3161	0.3059
2A	0.3215	0.3350	2B	0.3207	0.3462	2C	0.3290	0.3538	2D	0.3290	0.3417
	0.3290	0.3350		0.3290	0.3538		0.3376	0.3616		0.3366	0.3369
	0.3290	0.3300		0.3290	0.3417		0.3371	0.3490		0.3290	0.3300
	0.3222	0.3243		0.3215	0.3350		0.3290	0.3417		0.3366	0.3369
2R	0.3222	0.3243	2S	0.3196	0.3602	2T	0.3290	0.3690	2U	0.3290	0.3300
	0.3290	0.3300		0.3290	0.3690		0.3381	0.3762		0.3366	0.3369
	0.3290	0.3180		0.3290	0.3538		0.3376	0.3616		0.3361	0.3245
	0.3231	0.3120		0.3207	0.3462		0.3290	0.3538		0.3290	0.3180
3A	0.3371	0.3490	3B	0.3376	0.3616	3C	0.3463	0.3687	3D	0.3451	0.3554
	0.3451	0.3554		0.3463	0.3687		0.3551	0.3760		0.3533	0.3620
	0.3440	0.3427		0.3451	0.3554		0.3533	0.3620		0.3515	0.3487
	0.3366	0.3369		0.3371	0.3490		0.3451	0.3554		0.3440	0.3427
3R	0.3366	0.3369	3S	0.3381	0.3762	3T	0.3480	0.3840	3U	0.3440	0.3428
	0.3440	0.3428		0.3480	0.3840		0.3571	0.3907		0.3515	0.3487
	0.3429	0.3307		0.3463	0.3687		0.3551	0.3760		0.3495	0.3339
	0.3361	0.3245		0.3376	0.3616		0.3463	0.3687		0.3429	0.3307
4A	0.3530	0.3597	4B	0.3548	0.3736	4C	0.3641	0.3804	4D	0.3615	0.3659
	0.3615	0.3659		0.3641	0.3804		0.3736	0.3874		0.3702	0.3722
	0.3590	0.3521		0.3615	0.3659		0.3702	0.3722		0.3670	0.3578
	0.3512	0.3465		0.3530	0.3597		0.3615	0.3659		0.3590	0.3521
4R	0.3512	0.3465	4S	0.3571	0.3907	4T	0.3668	0.3957	4U	0.3590	0.3521
	0.3590	0.3521		0.3668	0.3957		0.3771	0.4034		0.3670	0.3578
	0.3567	0.3389		0.3641	0.3804		0.3736	0.3874		0.3640	0.3440
	0.3495	0.3339		0.3548	0.3736		0.3641	0.3804		0.3567	0.3389
5A	0.3702	0.3722	5B	0.3736	0.3874	5C	0.3870	0.3958	5D	0.3825	0.3798
	0.3825	0.3798		0.3870	0.3958		0.4006	0.4044		0.3951	0.3876
	0.3783	0.3646		0.3825	0.3798		0.3951	0.3876		0.3898	0.3716
	0.3670	0.3578		0.3702	0.3722		0.3825	0.3798		0.3783	0.3646
5A1	0.3670	0.3578	5A2	0.3686	0.3649	5A3	0.3744	0.3685	5A4	0.3726	0.3612
	0.3686	0.3649		0.3702	0.3722		0.3763	0.3760		0.3744	0.3685
	0.3744	0.3685		0.3763	0.3760		0.3825	0.3798		0.3804	0.3721
	0.3726	0.3612		0.3744	0.3685		0.3804	0.3721		0.3783	0.3646

Performance Groups - Cromaticity

Region	x	y	Region	x	y	Region	x	y	Region	x	y
7B1	0.4221	0.3984	7B2	0.4259	0.4073	7B3	0.4322	0.4096	7B4	0.4281	0.4006
	0.4259	0.4073		0.4299	0.4165		0.4364	0.4188		0.4322	0.4096
	0.4322	0.4096		0.4364	0.4188		0.4430	0.4212		0.4385	0.4119
	0.4281	0.4006		0.4322	0.4096		0.4385	0.4119		0.4342	0.4028
7C1	0.4342	0.4028	7C2	0.4385	0.4119	7C3	0.4449	0.4141	7C4	0.4403	0.4049
	0.4385	0.4119		0.4430	0.4212		0.4496	0.4236		0.4449	0.4141
	0.4449	0.4141		0.4496	0.4236		0.4562	0.4260		0.4513	0.4164
	0.4403	0.4049		0.4449	0.4141		0.4513	0.4164		0.4465	0.4071
7D1	0.4259	0.3853	7D2	0.4300	0.3939	7D3	0.4359	0.3960	7D4	0.4316	0.3873
	0.4300	0.3939		0.4342	0.4028		0.4403	0.4049		0.4359	0.3960
	0.4359	0.3960		0.4403	0.4049		0.4465	0.4071		0.4418	0.3981
	0.4316	0.3873		0.4359	0.3960		0.4418	0.3981		0.4373	0.3893
8A	0.4465	0.4071	8B	0.4562	0.4260	8C	0.4687	0.4289	8D	0.4582	0.4099
	0.4582	0.4099		0.4687	0.4289		0.4813	0.4319		0.4700	0.4126
	0.4483	0.3918		0.4582	0.4099		0.4700	0.4126		0.4593	0.3944
	0.4373	0.3893		0.4465	0.4071		0.4582	0.4099		0.4483	0.3918
8A1	0.4373	0.3893	8A2	0.4418	0.3981	8A3	0.4475	0.3994	8A4	0.4582	0.4099
	0.4418	0.3981		0.4465	0.4071		0.4523	0.4085		0.4700	0.4126
	0.4475	0.3994		0.4523	0.4085		0.4582	0.4099		0.4593	0.3944
	0.4428	0.3906		0.4475	0.3994		0.4532	0.4008		0.4483	0.3918
8B1	0.4465	0.4071	8B2	0.4513	0.4164	8B3	0.4573	0.4178	8B4	0.4523	0.4085
	0.4513	0.4164		0.4562	0.4260		0.4624	0.4274		0.4573	0.4178
	0.4573	0.4178		0.4624	0.4274		0.4687	0.4289		0.4634	0.3193
	0.4523	0.4085		0.4573	0.4178		0.4634	0.4193		0.4582	0.4099
8C1	0.4582	0.4099	8C2	0.4634	0.4139	8C3	0.4695	0.4207	8C4	0.4641	0.4112
	0.4634	0.4193		0.4687	0.4289		0.4750	0.4304		0.4695	0.4207
	0.4695	0.4207		0.4750	0.4304		0.4813	0.4319		0.4756	0.4221
	0.4641	0.4112		0.4695	0.4207		0.4756	0.4221		0.4700	0.4126
8D1	0.4483	0.3919	8D2	0.4532	0.4008	8D3	0.4589	0.4021	8D4	0.4538	0.3931
	0.4352	0.4008		0.4582	0.4099		0.4641	0.4112		0.4589	0.4021
	0.4589	0.4021		0.4641	0.4112		0.4700	0.4126		0.4646	0.4034
	0.4538	0.3931		0.4589	0.4021		0.4646	0.4034		0.4593	0.3944
E1A	0.4925	0.4154	E1B	0.4984	0.4245	E1C	0.5081	0.4244	E1D	0.5019	0.4153
	0.4984	0.4245		0.5043	0.4336		0.5143	0.4335		0.5081	0.4244
	0.5081	0.4244		0.5143	0.4335		0.5242	0.4334		0.5177	0.4244
	0.5019	0.4153		0.5081	0.4244		0.5177	0.4244		0.5113	0.4153

Performance Groups - Cromaticity

Region	x	y	Region	x	y	Region	x	y	Region	x	y
5B1	0.3702	0.3722	5B2	0.3719	0.3797	5B3	0.3782	0.3837	5B4	0.3763	0.3760
	0.3719	0.3797		0.3736	0.3874		0.3802	0.3916		0.3782	0.3837
	0.3782	0.3837		0.3802	0.3916		0.3869	0.3958		0.3847	0.3877
	0.3763	0.3760		0.3782	0.3837		0.3847	0.3877		0.3825	0.3798
5C1	0.3825	0.3798	5C2	0.3847	0.3877	5C3	0.3912	0.3917	5C4	0.3887	0.3836
	0.3847	0.3877		0.3869	0.3958		0.3937	0.4001		0.3912	0.3917
	0.3912	0.3917		0.3937	0.4001		0.4006	0.4044		0.3978	0.3958
	0.3887	0.3836		0.3912	0.3917		0.3978	0.3958		0.3950	0.3875
5D1	0.3783	0.3646	5D2	0.3804	0.3721	5D3	0.3863	0.3758	5D4	0.3840	0.3681
	0.3804	0.3721		0.3825	0.3798		0.3887	0.3836		0.3863	0.3758
	0.3863	0.3758		0.3887	0.3836		0.3950	0.3875		0.3924	0.3794
	0.3840	0.3681		0.3863	0.3758		0.3924	0.3794		0.3898	0.3716
6A	0.3941	0.3848	6B	0.3996	0.4015	6C	0.4146	0.4089	6D	0.4080	0.3916
	0.4080	0.3916		0.4146	0.4089		0.4299	0.4165		0.4221	0.3985
	0.4017	0.3752		0.4080	0.3916		0.4221	0.3985		0.4147	0.3814
	0.3889	0.3690		0.3941	0.3848		0.4080	0.3916		0.4017	0.3752
6A1	0.3889	0.3690	6A2	0.3915	0.3768	6A3	0.3981	0.3800	6A4	0.4080	0.3916
	0.3915	0.3768		0.3941	0.3848		0.4010	0.3882		0.3981	0.3800
	0.3981	0.3800		0.4010	0.3882		0.4080	0.3916		0.4048	0.3882
	0.3953	0.3720		0.3981	0.3800		0.4048	0.3832		0.4017	0.3751
6B1	0.3941	0.3848	6B2	0.3968	0.3930	6B3	0.4040	0.3966	6B4	0.4010	0.3882
	0.3968	0.3930		0.3996	0.4015		0.4071	0.4052		0.4040	0.3966
	0.4040	0.3966		0.4071	0.4052		0.4146	0.4089		0.4113	0.4001
	0.4010	0.3882		0.4040	0.3966		0.4113	0.4001		0.4080	0.3916
6C1	0.4080	0.3916	6C2	0.4113	0.4001	6C3	0.4186	0.4037	6C4	0.4150	0.3950
	0.4113	0.4001		0.4146	0.4089		0.4222	0.4127		0.4186	0.4037
	0.4186	0.4037		0.4222	0.4127		0.4299	0.4165		0.4259	0.4073
	0.4150	0.3950		0.4186	0.4037		0.4259	0.4073		0.4221	0.3984
6D1	0.4017	0.3751	6D2	0.4048	0.3832	6D3	0.4116	0.3865	6D4	0.4062	0.3782
	0.4048	0.3832		0.4080	0.3916		0.4150	0.3950		0.4116	0.3865
	0.4116	0.3865		0.4150	0.3960		0.4221	0.3984		0.4183	0.3898
	0.4082	0.3782		0.4116	0.3865		0.4183	0.3898		0.4147	0.3814
7A	0.4221	0.3985	7B	0.4299	0.4165	7C	0.4430	0.4212	7D	0.4342	0.4028
	0.4342	0.4028		0.4430	0.4212		0.4562	0.4260		0.4465	0.4071
	0.4260	0.3853		0.4342	0.4028		0.4465	0.4071		0.4373	0.3893
	0.4147	0.3814		0.4221	0.3985		0.4342	0.4028		0.4260	0.3853
7A1	0.4147	0.3814	7A2	0.4183	0.3898	7A3	0.4242	0.3919	7A4	0.4203	0.3833
	0.4183	0.3898		0.4221	0.3984		0.4281	0.4006		0.4242	0.3919
	0.4242	0.3919		0.4281	0.4006		0.4342	0.4028		0.4300	0.3939
	0.4203	0.3833		0.4242	0.3919		0.4300	0.3939		0.4259	0.3853

Performance Groups - Cromaticity

Color	Kit	Chromaticity Bins
Cool White	65	1A,1B,1C,1D
	57	2A,2B,2C,2D
	50	3A,3B,3C,3D
	45	4A,4B,4C,4D
Neutral White	40	5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4, 5D1,5D2,5D3,5D4
	35	6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4, 6D1,6D2,6D3,6D4
Warm White	30	7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4, 7D1,7D2,7D3,7D4
	27	8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4, 8D1,8D2,8D3,8D4
Amber	22	E1A,E1B,E1C,E1D

Ordering Description:

White LEDs have performance distribution and been classified into multiple color groups.

It is recommended to order products in combination of color groups.

Color group classification for reference：65, 57, 50, 45, 40, 35, 30, 27, 22.