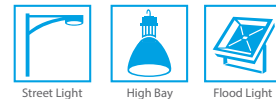
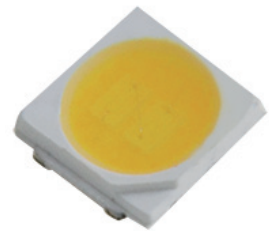


PLCC Series

3030 1W UE CRI70

Datasheet



Introduction :

EMC 3030 6V is a surface-mount LED which uses standard package dimension of 3.0 x 3.2 x 0.6mm, enabling drop-in replacement for existing 3030 packages. Besides, EMC package is heat-resistant and especially suitable for high power applications. 3030 6V Series comes in all ANSI CCTs and delivers the efficacy and reliability required for outdoor street light applications.

Description :

- Industry standard compatible 3.0mmx3.2mm package
- Wide viewing angle : 120°
- Enables 3, 5 step MacAdam ellipse kits
- CRI (Ra) min. 70
- Typ. Luminous flux :160 lm @ 4000K

Feature and Benefits :

- High luminous Flux and high efficiency
- Based on Blue : InGaN technology
- Excellent performance and visibility
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance
- ANSI Compliant color binning



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General Information

Ordering Code Format

2 T 1 2 0 1 x W A 7 0 0 6 x x x
 X1 X2 X3-X4 X5-X6 X7-X8 X9 X10-X11 X12-X13 X14-X16

X1		X2		X3-X4		X5-X6		X7-X8	
Type		Component		Series		Wattage		Color/CCT	
2	Emitter	T	PLCC	12	3030	01	1W	65	6500K
								57	5700K
								50	5000K
								45	4500K
								40	4000K
								35	3500K
								30	3000K

X9		X10-X11		X12-X13		X14-X16	
BIN		CRI		Voltage		Serial Number	
A	ANSI	70	CRI (Ra) 70	06	6V	-	-

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Value	Units
Forward Current	I_F	200	mA
Pulse Forward Current (tp<=100μs, Duty cycle=0.25)	I_{pulse}	400	mA
Reverse Current	I_R	10	uA
Reverse Voltage	V_R	-	V
LED Junction Temperature	T_J	125	°C
Operating Temperature	-	-40 ~ +85	°C
Storage Temperature	-	-40 ~ +125	°C
ESD Sensitivity (HBM)	V_B	2,000	V
Soldering Temperature	T_s	Reflow Soldering : 255~260°C/10~30sec Manual Soldering : 350°C/3sec	

Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.

Characteristics

Parameter	Symbol	Value	Units
Viewing Angle (Typ.)	$2\theta_{1/2}$	120	Degree
Thermal resistance	-	10	°C/W
CRI(Ra)	-	70	-
CCT (Cool White) (Neutral White) (Warm White)	-	6500	K
		5700	
		5000	
		4500	
		4000	
		3500	
		3000	
		2700	
JEDEC Moisture Sensitivity	-	Level 2a Floor Life Conditions: ≤30°C / 60% RH Soak Requirements(Standard) Time (hours): 120+1/-0 Conditions: 60°C / 60% RH	

Notes:

1. $2\theta_{1/2}$ is the off-axis angle where the luminous intensity is half of the axial luminous intensity.
2. Color Rendering index CRI tolerance: ±2.
3. CIE x/y tolerance: ±0.005

Luminous Flux Characteristic

Luminous Flux Characteristics, $I_f=150\text{mA}$ and $T_j=25^\circ\text{C}$

Color	CRI (Ra)	Group	Min. Luminous flux (lm)	Max. Luminous flux (lm)	Forward Current (mA)	Order Code
6500K	70	V4	140	150	150	2T120165A7006004
		V5	150	160		
5700K	70	V5	150	160	150	2T120157A7006004
		W1	160	180		
5000K	70	V5	150	160	150	2T120150A7006004
		W1	160	180		
4500K	70	V5	150	160	150	2T120145A7006004
		W1	160	180		
4000K	70	V5	150	160	150	2T120140A7006004
		W1	160	180		
3500K	70	V4	140	150	150	2T120135A7006004
		V5	150	160		
3000K	70	V4	140	150	150	2T120130A7006004
		V5	150	160		
2700K	70	V3	130	140	150	2T120127A7006004
		V4	140	150		

Note:

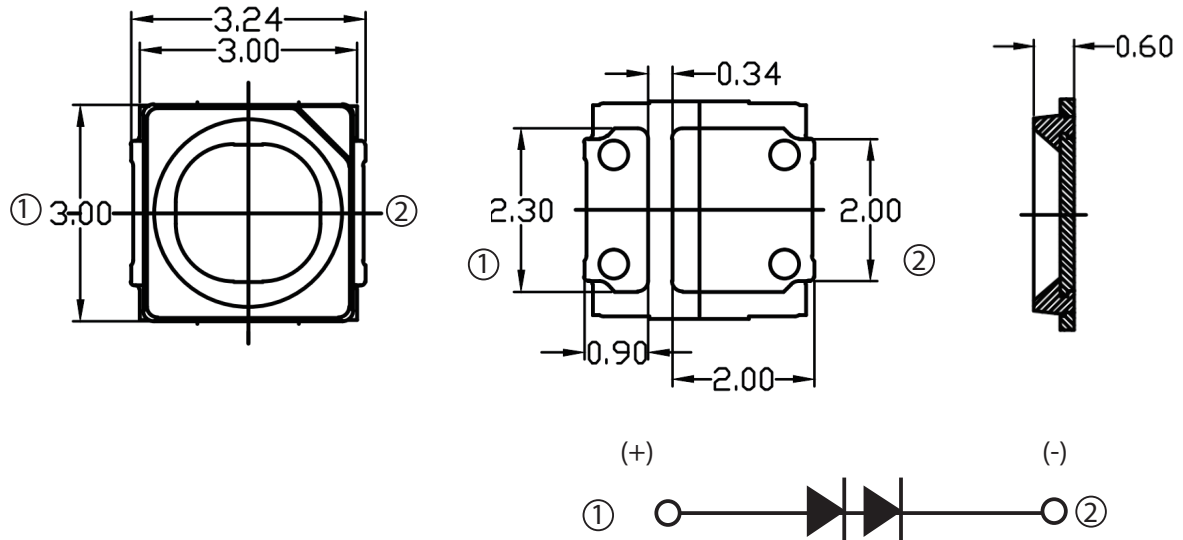
The luminous flux performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of $\pm 10\%$ on flux measurements.

Voltage Bin Structure

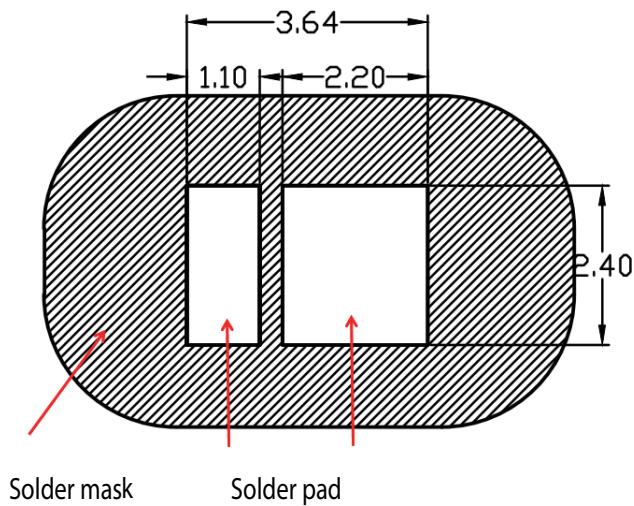
Group	Min. Voltage (V)	Max. Voltage (V)
U58	5.8	6.0
U60	6.0	6.2
U62	6.2	6.4

Note:
Forward voltage measurement allowance is $\pm 0.06V$.

Mechanical Dimensions



Solder Pad



Notes:

1. All dimensions are measured in mm.
2. Tolerance : ± 0.20 mm

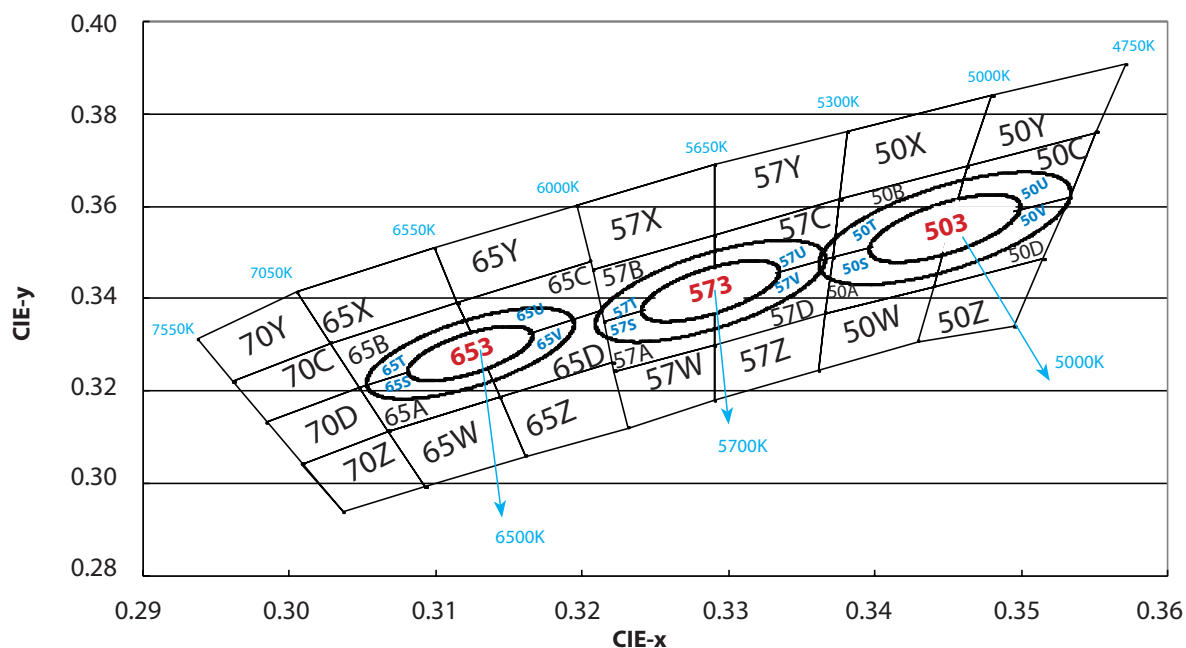
Color BIN code

Color region stay within Macadam "3-Step/5-step" ellipse from the chromaticity center.
 The chromaticity center refers to ANSI C78.377:2008.
 Please refer to ANSI C78.377 for the chromaticity center.

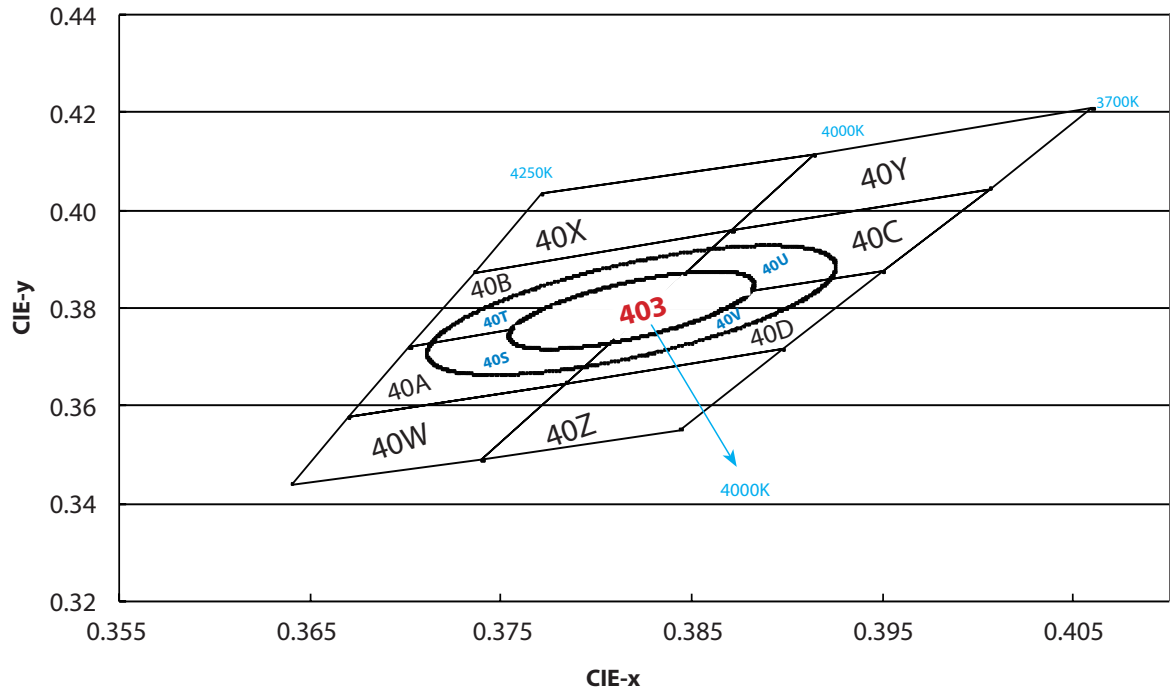
CCT	Steps	Cx	Cy	a	b	theta
2700K	5	0.4578	0.4101	0.01350	0.00700	53.70
3000K	5	0.4338	0.4030	0.01390	0.00680	53.22
3500K	5	0.4073	0.3917	0.01545	0.00690	54.00
4000K	5	0.3818	0.3797	0.01565	0.00670	53.72
5000K	5	0.3447	0.3553	0.01370	0.00590	59.62
5700K	5	0.3287	0.3417	0.01243	0.00533	59.09
6500K	5	0.3123	0.3282	0.01115	0.00475	58.57

CCT	Steps	Cx	Cy	a	b	theta
2700K	3	0.4578	0.4101	0.00810	0.00420	53.70
3000K	3	0.4338	0.4030	0.00834	0.00408	53.22
3500K	3	0.4073	0.3917	0.00927	0.00414	54.00
4000K	3	0.3818	0.3797	0.00939	0.00402	53.72
5000K	3	0.3447	0.3553	0.00822	0.00354	59.62
5700K	3	0.3287	0.3417	0.00746	0.00320	59.09
6500K	3	0.3123	0.3282	0.00669	0.00285	58.57

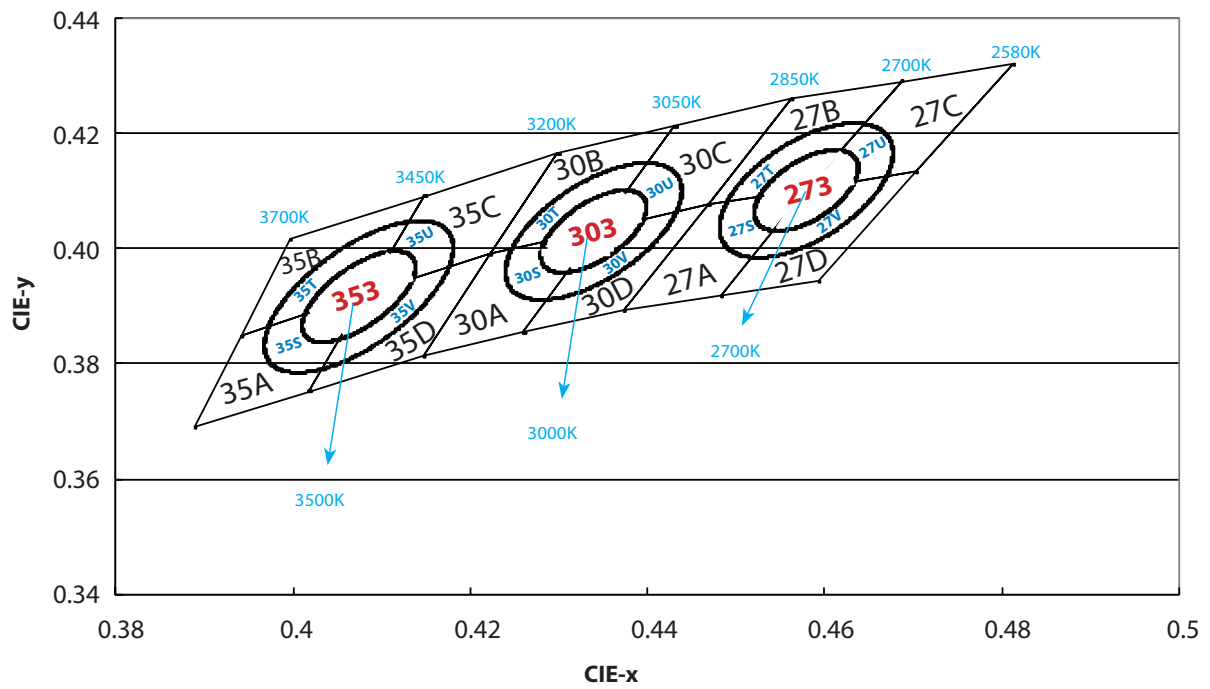
Cool White



Neutral White



Warm White



6500K

65X		65B		65A		65W	
X	Y	X	Y	X	Y	X	Y
0.3005	0.3415	0.3115	0.3391	0.3130	0.3290	0.3068	0.3113
0.3099	0.3509	0.3028	0.3304	0.3048	0.3207	0.3144	0.3186
0.3115	0.3391	0.3048	0.3207	0.3068	0.3113	0.3161	0.3059
0.3028	0.3304	0.3130	0.3290	0.3144	0.3186	0.3093	0.2993

65Y		65C		65D		65Z	
X	Y	X	Y	X	Y	X	Y
0.3099	0.3509	0.3205	0.3481	0.3213	0.3373	0.3144	0.3186
0.3196	0.3602	0.3115	0.3391	0.3130	0.3290	0.3221	0.3261
0.3205	0.3481	0.3130	0.3290	0.3144	0.3186	0.3231	0.3120
0.3115	0.3391	0.3213	0.3373	0.3221	0.3261	0.3161	0.3059

5700K

57X		57B		57A		57W	
X	Y	X	Y	X	Y	X	Y
0.3196	0.3602	0.3290	0.3538	0.3290	0.3417	0.3222	0.3243
0.3290	0.3690	0.3207	0.3462	0.3215	0.3350	0.3290	0.3300
0.3290	0.3538	0.3215	0.3350	0.3222	0.3243	0.3290	0.3180
0.3207	0.3462	0.3290	0.3417	0.3290	0.3300	0.3231	0.3120

57Y		57C		57D		57Z	
X	Y	X	Y	X	Y	X	Y
0.3290	0.3690	0.3376	0.3616	0.3371	0.3490	0.3290	0.3300
0.3381	0.3762	0.3290	0.3538	0.3290	0.3417	0.3366	0.3369
0.3376	0.3616	0.3290	0.3417	0.3290	0.3300	0.3361	0.3245
0.3290	0.3538	0.3371	0.3490	0.3366	0.3369	0.3290	0.3180

5000K

50X		50B		50A		50W	
X	Y	X	Y	X	Y	X	Y
0.3381	0.3762	0.3463	0.3687	0.3451	0.3554	0.3366	0.3369
0.3480	0.3840	0.3376	0.3616	0.3371	0.3490	0.3440	0.3427
0.3463	0.3687	0.3371	0.3490	0.3366	0.3369	0.3429	0.3307
0.3376	0.3616	0.3451	0.3554	0.3440	0.3427	0.3361	0.3245

50Y		50C		50D		50Z	
X	Y	X	Y	X	Y	X	Y
0.3480	0.3840	0.3551	0.3760	0.3533	0.3620	0.3440	0.3427
0.3571	0.3907	0.3463	0.3687	0.3451	0.3554	0.3515	0.3487
0.3551	0.3760	0.3451	0.3554	0.3440	0.3427	0.3495	0.3339
0.3463	0.3687	0.3533	0.3620	0.3515	0.3487	0.3429	0.3307

4000K

40X		40B		40A		40W	
X	Y	X	Y	X	Y	X	Y
0.3771	0.4034	0.3871	0.3959	0.3828	0.3803	0.3670	0.3578
0.3736	0.3874	0.3736	0.3874	0.3702	0.3722	0.3640	0.3440
0.3871	0.3959	0.3702	0.3722	0.3670	0.3578	0.3740	0.3491
0.3914	0.4115	0.3828	0.3803	0.3784	0.3647	0.3784	0.3647

40Y		40C		40D		40Z	
X	Y	X	Y	X	Y	X	Y
0.3914	0.4115	0.4006	0.4044	0.3950	0.3875	0.3784	0.3647
0.3871	0.3959	0.3871	0.3959	0.3828	0.3803	0.3740	0.3491
0.4006	0.4044	0.3828	0.3803	0.3784	0.3647	0.3844	0.3552
0.4060	0.4208	0.3950	0.3875	0.3898	0.3716	0.3898	0.3716

3500K

35A		35B		35C		35D	
X	Y	X	Y	X	Y	X	Y
0.4083	0.3921	0.4148	0.4090	0.4299	0.4165	0.4223	0.399
0.3941	0.3848	0.3996	0.4015	0.4148	0.4090	0.4083	0.3921
0.3889	0.3690	0.3941	0.3848	0.4083	0.3921	0.4018	0.3752
0.4018	0.3752	0.4083	0.3921	0.4223	0.399	0.4147	0.3814

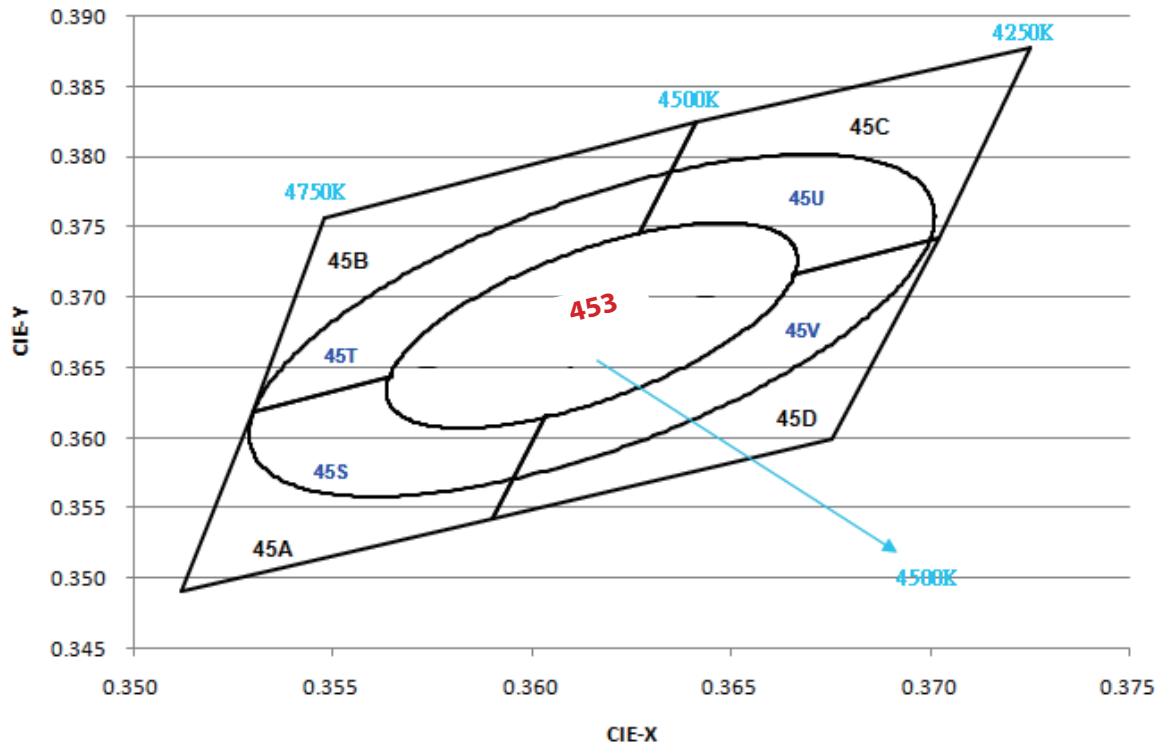
3000K

30A		30B		30C		30D	
X	Y	X	Y	X	Y	X	Y
0.4345	0.4033	0.4431	0.4213	0.4562	0.4260	0.4468	0.4077
0.4223	0.3990	0.4299	0.4165	0.4431	0.4213	0.4345	0.4033
0.4147	0.3814	0.4223	0.3990	0.4345	0.4033	0.4260	0.3854
0.4260	0.3854	0.4345	0.4033	0.4468	0.4077	0.4373	0.3893

2700K

27A		27B		27C		27D	
X	Y	X	Y	X	Y	X	Y
0.4578	0.4101	0.4687	0.4289	0.4813	0.4319	0.4703	0.4132
0.4468	0.4077	0.4562	0.4260	0.4687	0.4289	0.4578	0.4101
0.4373	0.3893	0.4468	0.4077	0.4578	0.4101	0.4483	0.3919
0.4483	0.3919	0.4578	0.4101	0.4703	0.4132	0.4593	0.3944

Neutral White 4500K

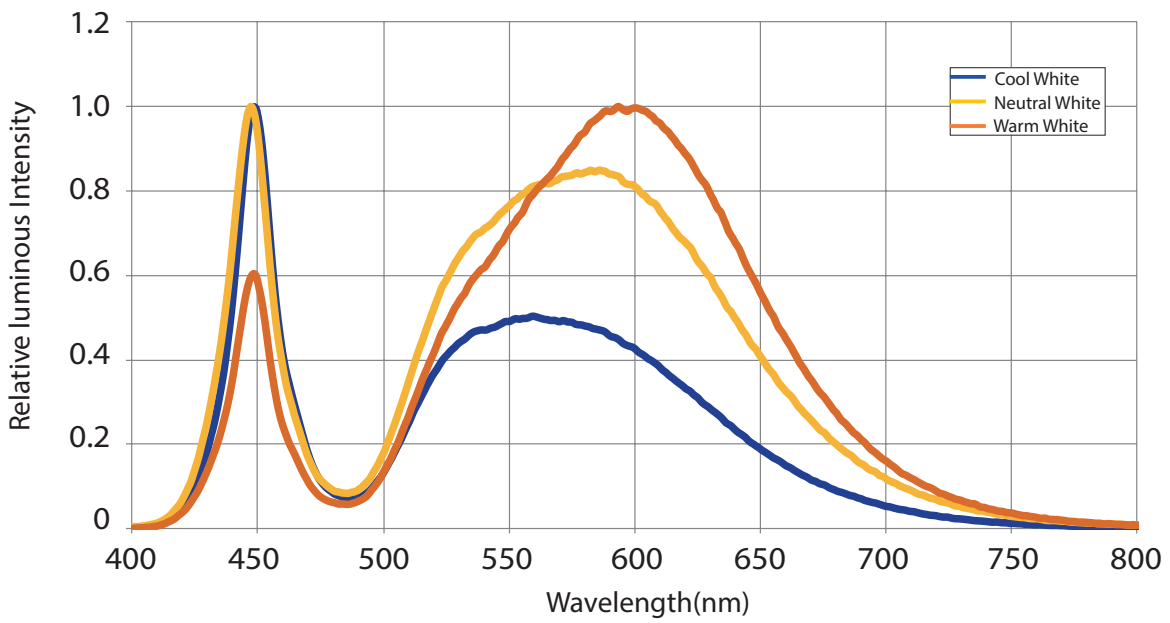


CCT	Steps	Cx	Cy	a	b	theta
4500K	3	0.3615	0.3680	0.00822	0.00354	59.62
4500K	5	0.3615	0.3680	0.0137	0.0059	59.62

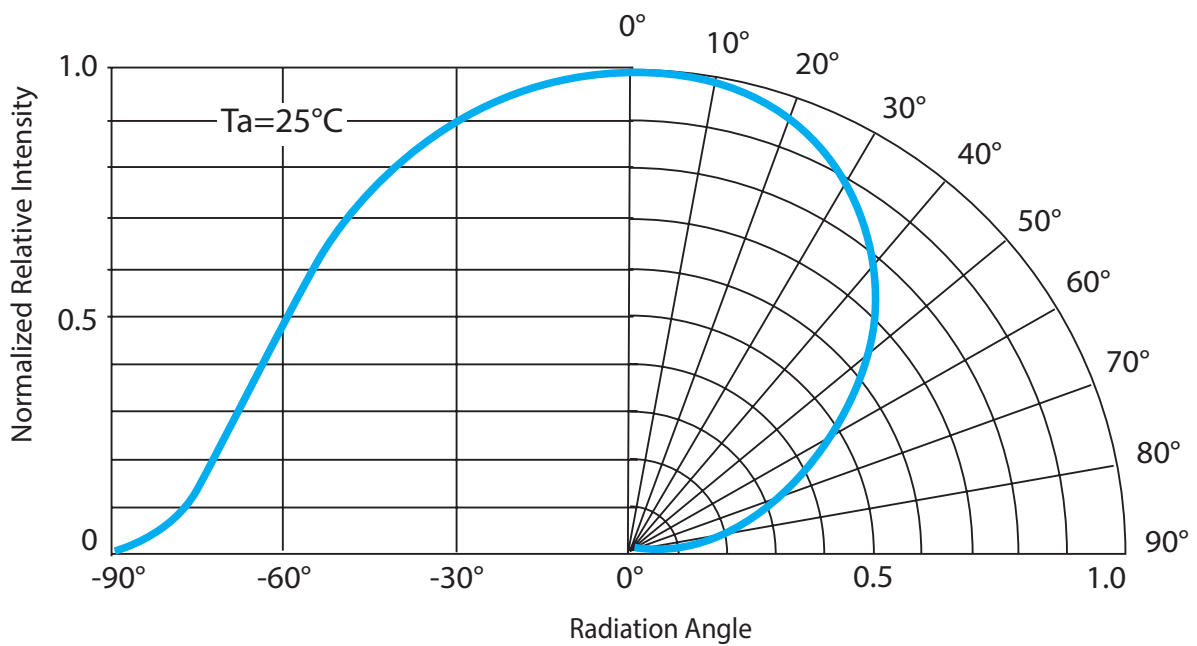
45A		45B		45C		45D	
X	Y	X	Y	X	Y	X	Y
0.3615	0.3680	0.3641	0.3825	0.3725	0.3878	0.3702	0.3743
0.3530	0.3618	0.3548	0.3757	0.3641	0.3825	0.3615	0.3680
0.3512	0.3491	0.3530	0.3618	0.3615	0.3680	0.3590	0.3542
0.3590	0.3542	0.3615	0.3680	0.3702	0.3743	0.3675	0.3599

Characteristic curve

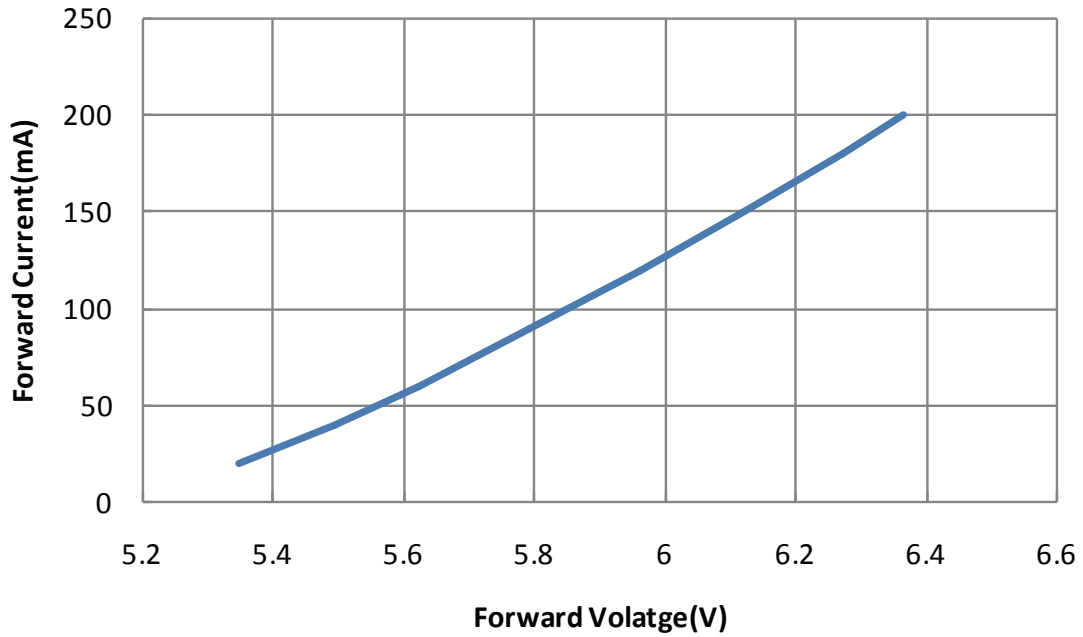
Color Spectrum <CRI (Ra) 70>



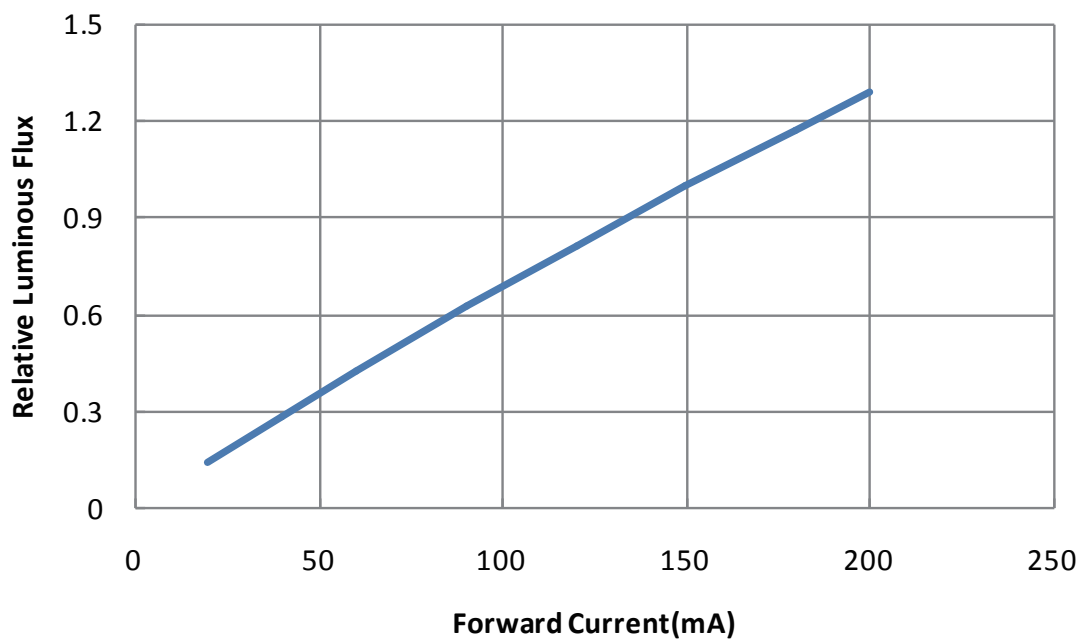
Beam Pattern



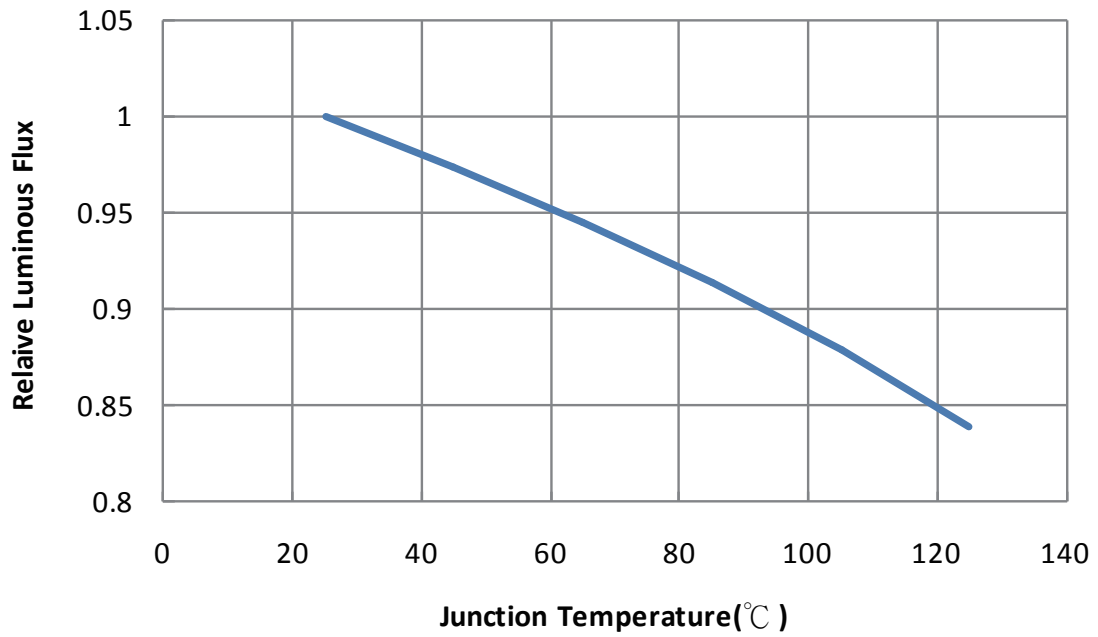
Forward Current vs. Forward Voltage



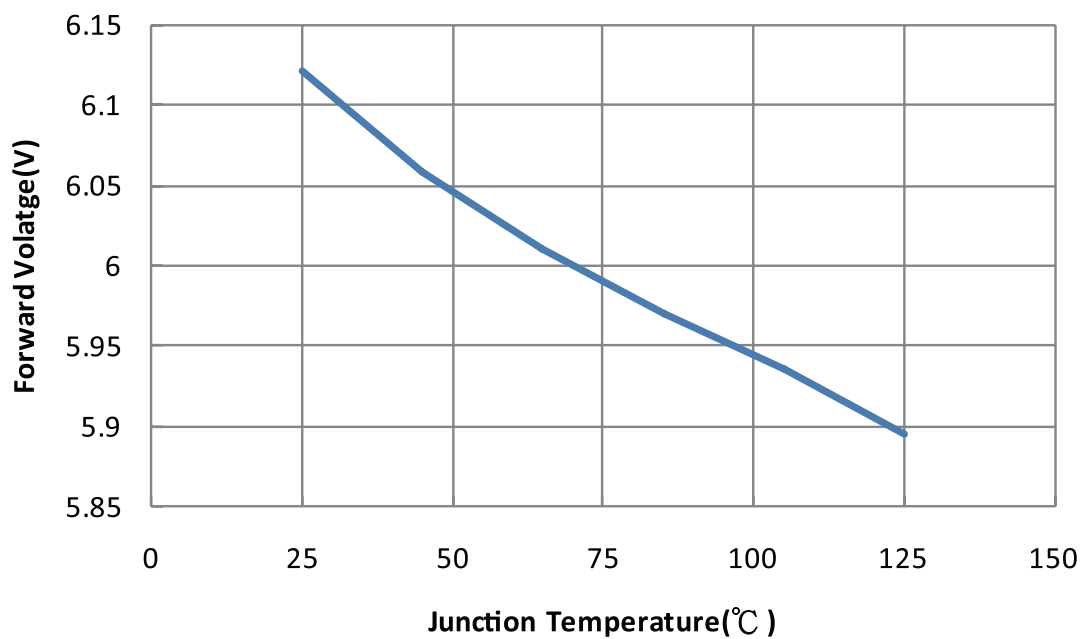
Relative Luminous flux vs. Forward Current

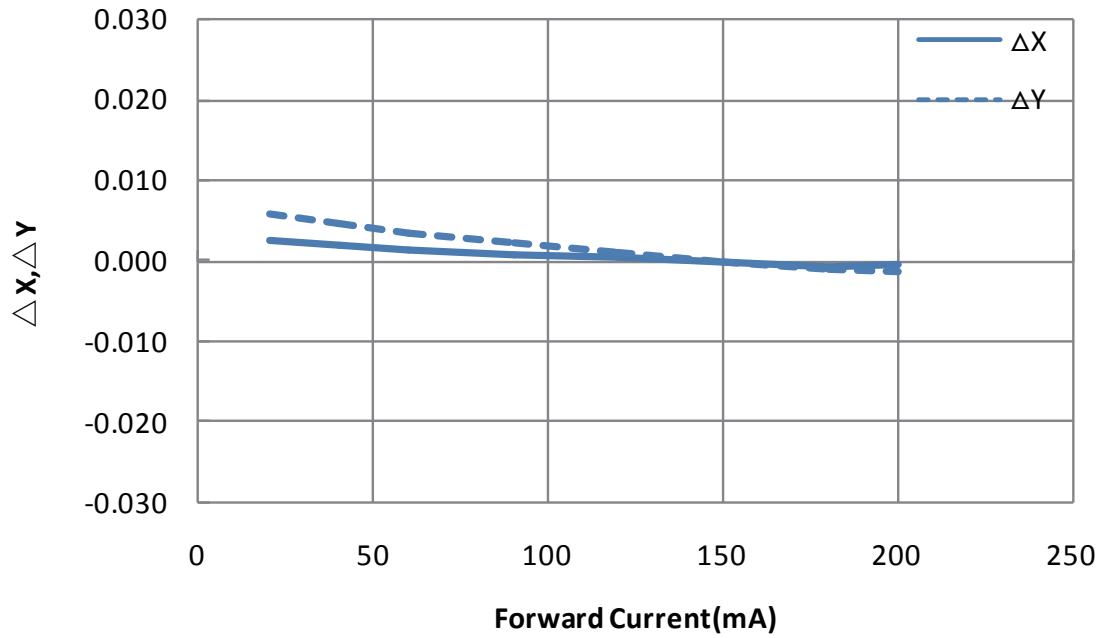


Relative Luminous Flux vs. Junction Temperature

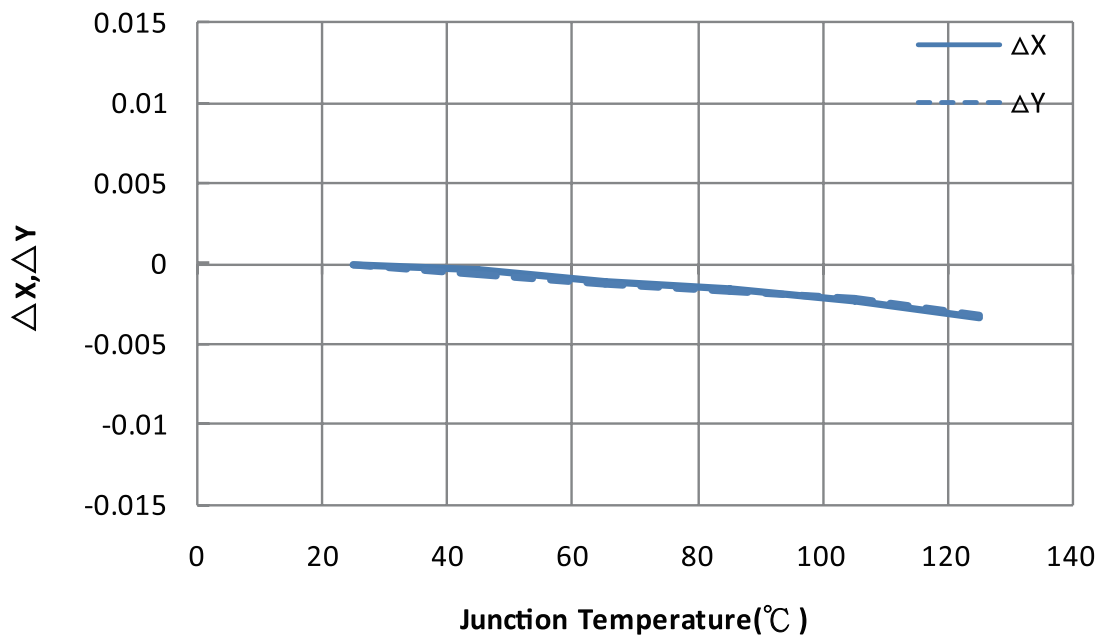


Forward Voltage vs. Junction Temperature

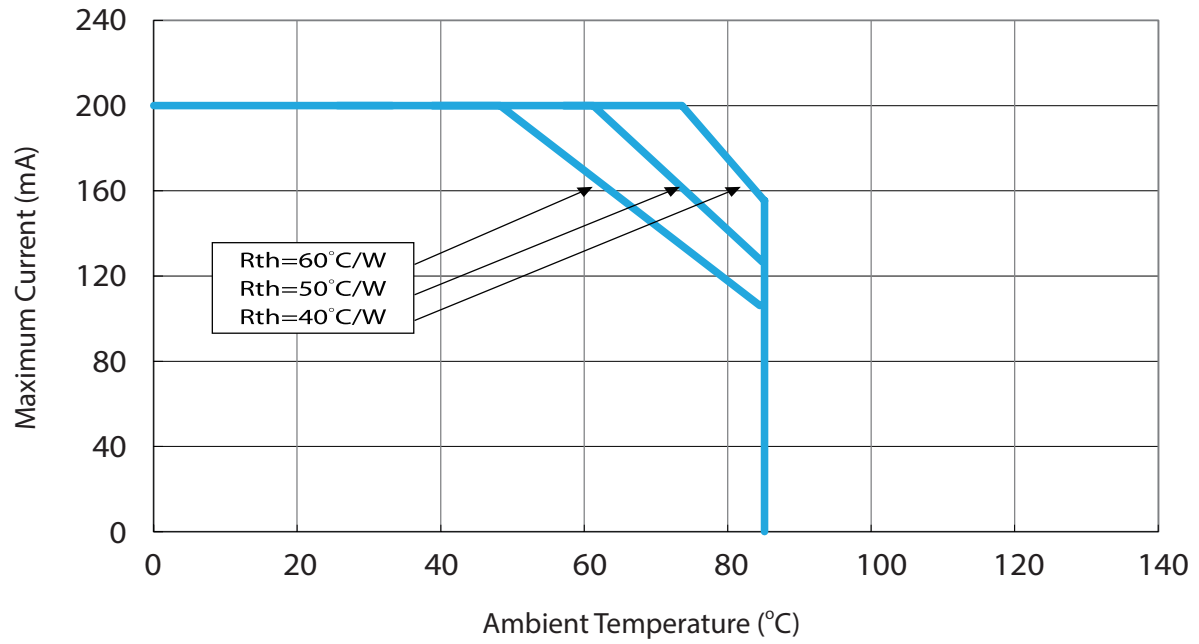




Δx,Δy vs. Junction Temperature

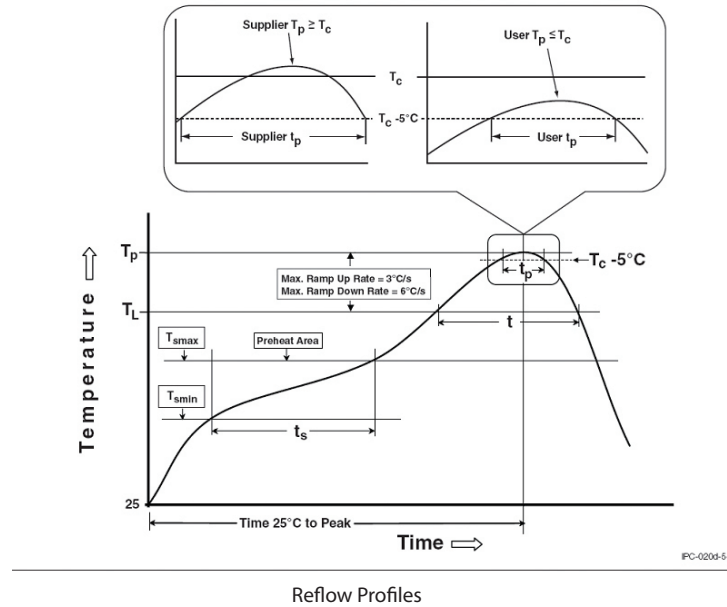


Maximum Current vs. Solder Pad Temperature



Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak Temperature min (T _{sm}) Temperature max (T _{smx}) Time (T _{sm} to T _{smx}) (t _s)	150 °C 200 °C 60-120 seconds
Average ramp-up rate (T _{smx} to T _p)	3 °C/second max.
Liquidous temperature (T _L) Time at liquidous (t _L)	217 °C 60-150 seconds
Peak package body temperature (T _p)*	255 °C ~260 °C *
Classification temperature (T _c)	260 °C
Time (t _p)** within 5 °C of the specified classification temperature (T _c)	30** seconds
Average ramp-down rate (T _p to T _{smx})	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Notes:

- * Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
- ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins \leq 10 sec	100 Cycle
3	Resistance to Soldering Heat	$T_{SOL}=260^{\circ}C$, 30 sec	3 times
4	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
5	High-Temperature Storage	$T_A=100^{\circ}C$	1,000 hrs
6	Low-Temperature Storage	$T_A=-40^{\circ}C$	1,000 hrs
7	Operation Life test	25°C	1,000 hrs
8	High Temperature Operation Life test	85°C	1,000 hrs
9	High Humidity Heat Life Test	60°C, 90%RH	1,000 hrs
10	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μA
Resistance to Soldering Heat	No dead lamps or visual damage	

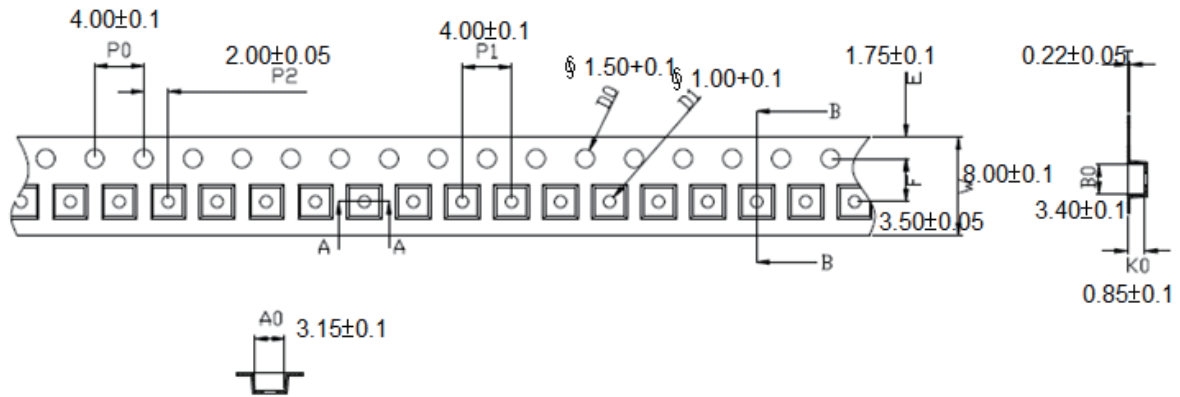
Cautions

LEDs should be stored or lighted in the environment of no sulfur.

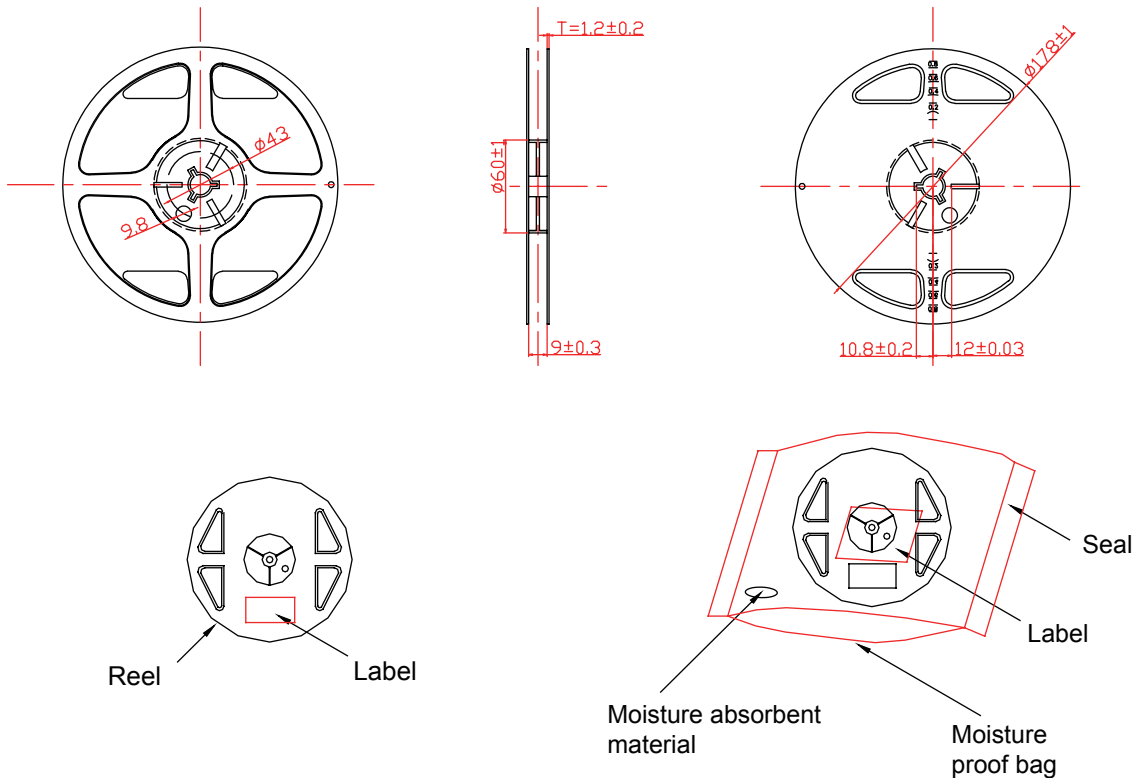
Some materials, such as plastic seals, printing ink, enclosures and adhesives, may contain sulfur.

LEDs also should not be exposed in the acid or halogen environment.

Product Packaging information



Reel Specification



Item	Quantity	Total	Dimensions(mm)
Reel	4,000pcs	4,000pcs	R=178
Starting with 150pcs empty, and 150pcs empty at the last			

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2019/05/17
2	Update the Color Bin Code 4500K	2021/04/12

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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