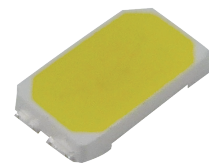


PLCC Series

ET-5630x-AF1W Series Datasheet



Features :

- High luminous Intensity and high efficiency
- Based on Blue : InGaN technology
- Wide viewing angle : 120°
- Excellent performance and visibility
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance

Typical Applications

- Signal and Symbol Luminaire
- Indoor Displays
- Backlighting (illuminated advertising, general lighting)

Table of Contents

General Information	3
Introduction	3
Product Nomenclature	3
LED Package Dimension and Polarity	4
Absolute Maximum Ratings	5
Luminous Flux Characteristics	6
Characteristic	6
Optical Characteristics	6
Electrical Characteristics	7
Forward Voltage Ranks	7
Characteristic Curves	8
Beam Pattern Diagram	8
Forward voltage & Forward current	8
Ambient temperature & Forward current	8
Luminous Flux & Wavelength	8
Forward current & Relative Intensity	8
JEDEC Information	9
Reliability Test Items	10
CIE Chromaticity Diagram	11
Cool White	11
Neutral White	12
Warm White	13
Product Packaging Information	14
Packaging	15
Package Label	15
Revision History	16
About Edison Opto	16

General Information

Introduction

Ultra high luminous efficacy, combined with the flexibility in design due to its slim and miniature size, PLCC LED Series are optimized to be used as Tube light for indoor lighting

Product Nomenclature

The following table describes the available color, power, and lens type. For more flux and forward voltage information, please consult the Bin Group document.

Table 1. PLCC 5630 series Nomenclature

<u>ET</u> X1		<u>5630</u> X2		<u>X</u> X3	-	<u>A</u> X4	<u>F</u> X5	<u>1</u> X6	<u>W</u> X7
X1 LED Item		X2 Module		X3 Emitting Color		X4 Power		X5~X6 Serial No.	
Code	Type	Code	Type	Code	Type	Code	Type	Code	Type
ET	Edison Top LED	5630	5.6x3.0mm	W	Cool White	A	0.5W	--	--
				H	Neutral White				
				X	Warm White				
X7 Housing Item									
Code	Type								
W	White surface								

LED Package Dimension and Polarity

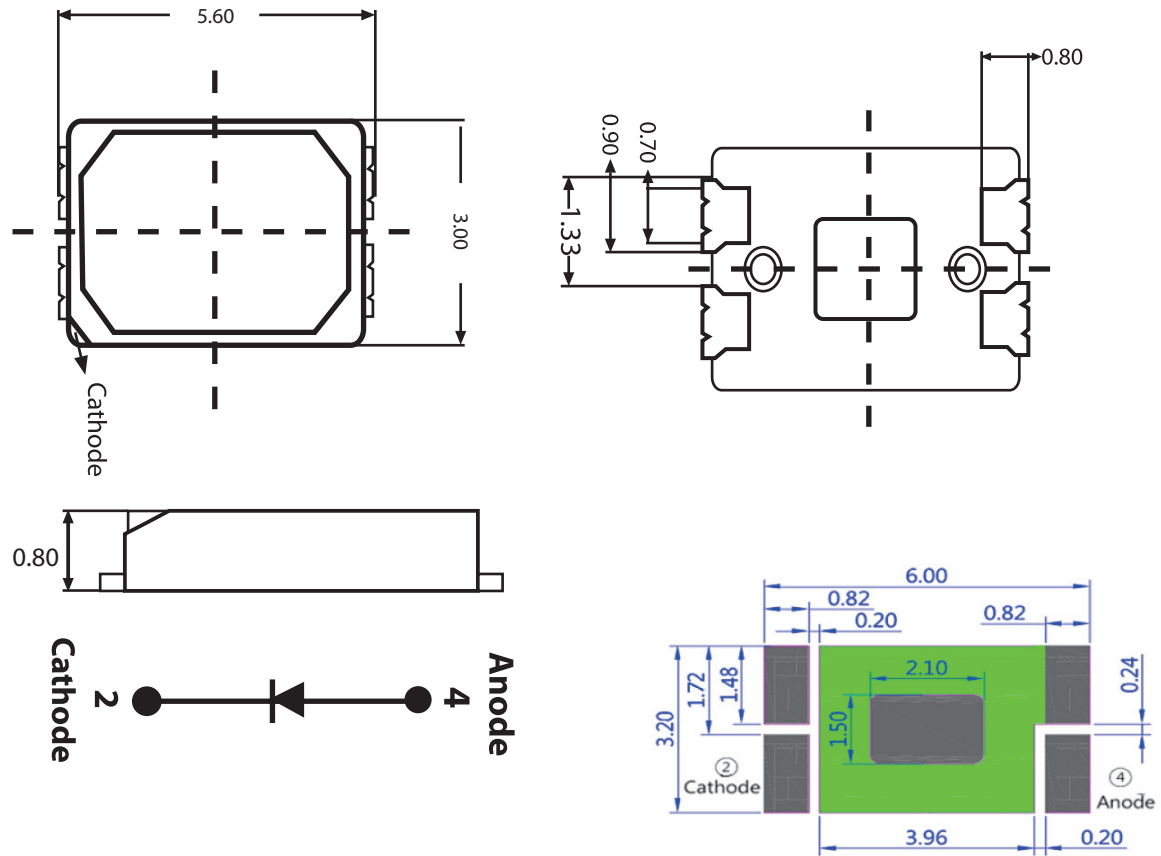


Figure 1. PLCC 5630 series Dimension & circuit diagram

Notes:

1. All dimensions are measured in mm.
2. Tolerance : ± 0.10 mm

Absolute Maximum Ratings

The following table describe absolute maximum ratings of PLCC 5630 series.

Table 2 . Absolute maximum ratings for PLCC 5630 series

Parameter	Rating	Units	Symbol
Forward Current	150	mA	I_F
Pulse Forward Current ($t_p \leq 10\text{ms}$, Duty cycle=1/10)	400	mA	
Forward Voltage	3.3	V	V_F
LED Junction Temperature	125	$^{\circ}\text{C}$	T_J
Operating Temperature	-40 ~ +80	$^{\circ}\text{C}$	
Storage Temperature	-40 ~ +80	$^{\circ}\text{C}$	
Soldering Temperature	260	$^{\circ}\text{C}$	
Manual Soldering at 350 $^{\circ}\text{C}$ (Max.)	3	Sec	

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.
3. t_p : Pulse width time

Luminous Flux Characteristics

The following table describes luminous flux of PLCC 5630 series.

Table 3. Luminous flux characteristics at $I_f=150\text{mA}$ and $T_a=25^\circ\text{C}$ for PLCC 5630 series

Part Name	Color	Min. Luminous Flux@150mA			Forward Current (mA)
		Group	Min. (lm)	Max. (lm)	
ET-5630W-AF1W	Cool White	N0	46.6	51.3	150
		O0	51.3	56.4	
		P0	56.4	62.0	
		Q0	62	68.2	
ET-5630H-AF1W	Neutral White	N0	46.6	51.3	150
		O0	51.3	56.4	
		P0	56.4	62.0	
		Q0	62	68.2	
ET-5630X-AF1W	Warm White	M0	42.4	46.6	150
		N0	46.6	51.3	
		O0	51.3	56.4	
		P0	56.4	62.0	

Note:

Luminous flux is measured with an accuracy of $\pm 10\%$

Characteristic

Optical Characteristics

The following table describes the color temperature and Color Rendering Index of PLCC 5630 series

Table 4. PLCC Optical Characteristics at $I_f=150\text{mA}$ and $T_a=25^\circ\text{C}$ for PLCC 5630 series

Part Name	Color	CCT(K)		CRI	View Angle (Degree)
		Min.	Max.		
ET-5630W-AF1W	Cool White	5,700	7,050	70	120
ET-5630H-AF1W	Neutral White	3,700	4,500	70	120
ET-5630X-AF1W	Warm White	2,700	3,200	70	120

Notes:

1. CRI is measured with an accuracy of ± 5
2. Color Temperature is measured with an accuracy of $\pm 5\%$

Electrical Characteristics

The following table describes forward voltage of PLCC 5630 series

Table 5. Electrical Characteristics Characteristics at $T_j=25^{\circ}\text{C}$ for PLCC 5630 series

Part Name	Color	V_f (V)		Forward Current (mA)	Thermal Resistance ($^{\circ}\text{C}/\text{W}$)
		Min.	Max.		
ET-5630W-AF1W	Cool White	3.0	3.6	150	15
ET-5630H-AF1W	Neutral White	3.0	3.6	150	15
ET-5630X-AF1W	Warm White	3.0	3.6	150	15

Note:

Forward Voltage is measured with an accuracy of $\pm 0.1\text{V}$

Forward Voltage Ranks

Table 6. Forward voltage rank at $T_a=25^{\circ}\text{C}$

Bin	Condition	Min	Max	Unit
1	$I_f=150\text{mA}$	3.0	3.1	V
2		3.1	3.2	
3		3.2	3.3	
4		3.3	3.4	
5		3.4	3.5	
6		3.5	3.6	

Note:

Forward voltage measurement allowance is $\pm 0.1\text{V}$.

Characteristic Curves

Beam Pattern Diagram

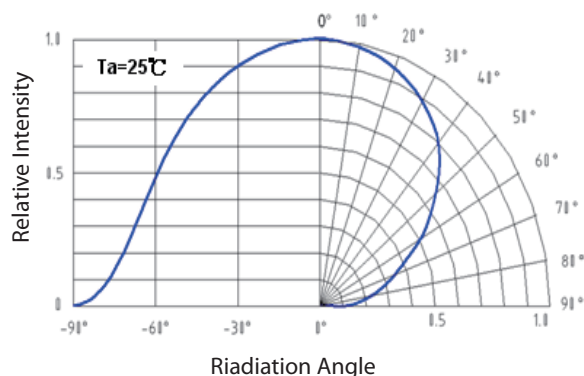


Figure 2. Beam pattern diagram for PLCC 5630 series

Luminous Flux & Wavelength

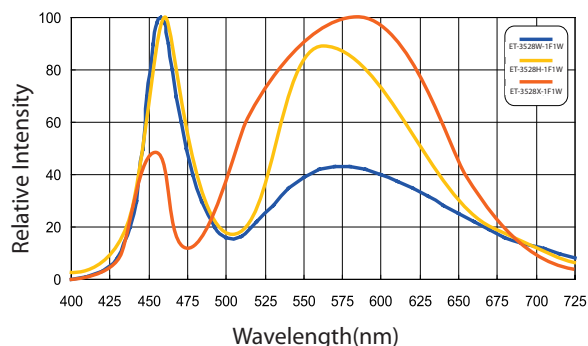


Figure 3. Wavelength & relative intensity for PLCC 5630 series

Forward voltage & Forward current

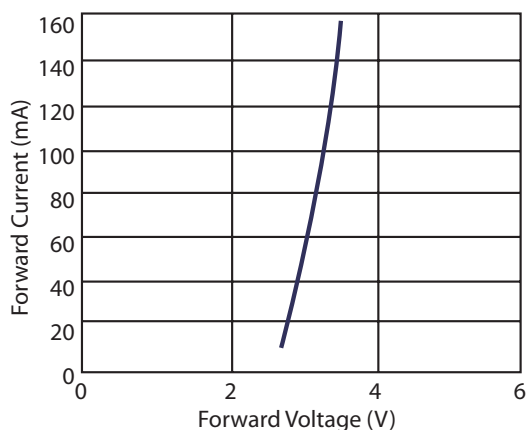


Figure 4. Forward voltage and forward current for PLCC 5630 series

Forward current & Relative Intensity

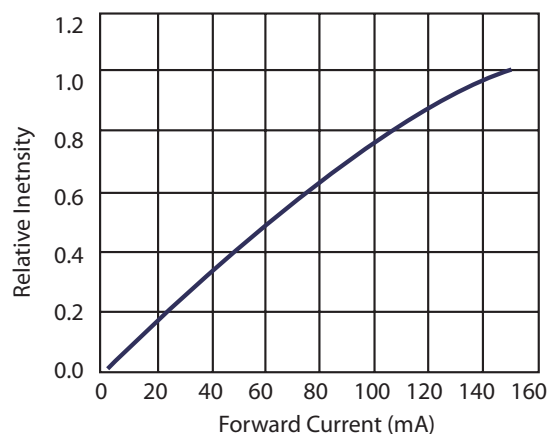


Figure 5. Forward current & relative intensity for PLCC 5630 series

Ambient temperature & Forward current

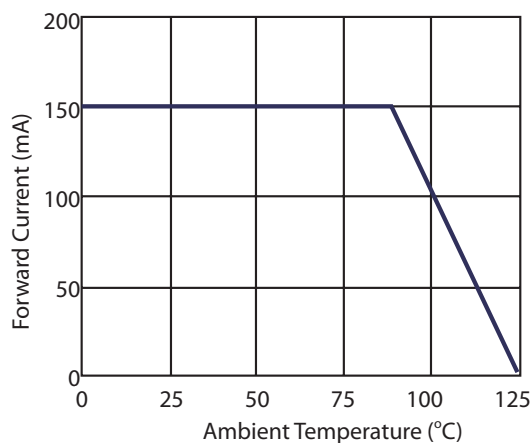


Figure 6. Ambient temperature and forward current for PLCC 5630 series

JEDEC Information

JEDEC is used to determine what classification level should be used for initial reliability qualification. Once identified, the LEDs can be properly packaged, stored and handled to avoid subsequent thermal and mechanical damage during the assembly solder attachment and/or repair operation. The present moisture sensitivity standard contains six levels, the lower the level, the longer the devices floor life. PLCC 5630 series are certified at level 2a. This means PLCC 5630 series have a floor life of 4 weeks before PLCC 5630 series need to re-baked.

Table 7. JEDEC characteristics for PLCC 5630

Level	Floor Life		Soak Requirements			
	Time	Conditions	Standard		Accelerated Environment	
			Time (hours)	Conditions	Time (hours)	Conditions
2a	4 weeks	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	696 +5/-0	$30^{\circ}\text{C} / 60\% \text{ RH}$	120 +1/-0	$60^{\circ}\text{C} / 60\% \text{ RH}$

Level	Floor Life		Soak Requirements			
	Time	Condition	Standard		Accelerated Environment	
			Time (hours)	Condition	Time (hours)	Condition
1	Unlimited	$\leq 30^{\circ}\text{C} / 85\% \text{ RH}$	168 +5/-0	$85^{\circ}\text{C} / 85\% \text{ RH}$		
2	1 year	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	168 +5/-0	$85^{\circ}\text{C} / 60\% \text{ RH}$		
2a	4 weeks	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	696 ¹ +5/-0	$30^{\circ}\text{C} / 60\% \text{ RH}$	120 +1/-0	$60^{\circ}\text{C} / 60\% \text{ RH}$
3	168 hours	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	192 ¹ +5/-0	$30^{\circ}\text{C} / 60\% \text{ RH}$	40 +5/-0	$60^{\circ}\text{C} / 60\% \text{ RH}$
4	72 hours	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	96 ¹ +5/-0	$30^{\circ}\text{C} / 60\% \text{ RH}$	20 +5/-0	$60^{\circ}\text{C} / 60\% \text{ RH}$
5	48 hours	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	72 ¹ +5/-0	$30^{\circ}\text{C} / 60\% \text{ RH}$	15 +5/-0	$60^{\circ}\text{C} / 60\% \text{ RH}$
5a	24 hours	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	48 ¹ +5/-0	$30^{\circ}\text{C} / 60\% \text{ RH}$	10 +5/-0V	$60^{\circ}\text{C} / 60\% \text{ RH}$
6	Time on tabel (TOL)	$\leq 30^{\circ}\text{C} / 60\% \text{ RH}$	TOL	$30^{\circ}\text{C} / 60\% \text{ RH}$		

Note:

The standard soak time includes a default value of 24 hours for semiconductor manufacturer's exposure time (MET) between bake and bag, and includes the maximum time allowed out of the bag at the distributor's facility.

Reliability Test Items

The following table describes operating life, mechanical, and environmental tests performed on PLCC 5630 series.

Table 8. Reliability Test

Stress Test	Stress Conditions	Stress Duration
Room Temperature Operation Life, RTOL	Ta=25°C, I _f =150mA	1000 hours
High Temperature Operation Life, HTOL	Ta=65°C, I _f =150mA	1000 hours
Low Temperature Operation Life, LTOL	Ta=-40°C I _f =150mA	1000 hours
High Temperature and high Humidity Operation Life, WHTOL	Ta=85°C, RH=85%, I _f =150mA	1000 hours
Thermal Shock	-40~125°C, 30min~30min	100 cycle

Notes:

- Reliability test 2 is performed after reliability test 1.
- Depending on the maximum derating curve.
- Failure Criteria:
 - Electrical failures
 - V_f Shift >=10%
 - Luminous Intensity
 - I_v Decay >= 35%

CIE Chromaticity Diagram

Cool White

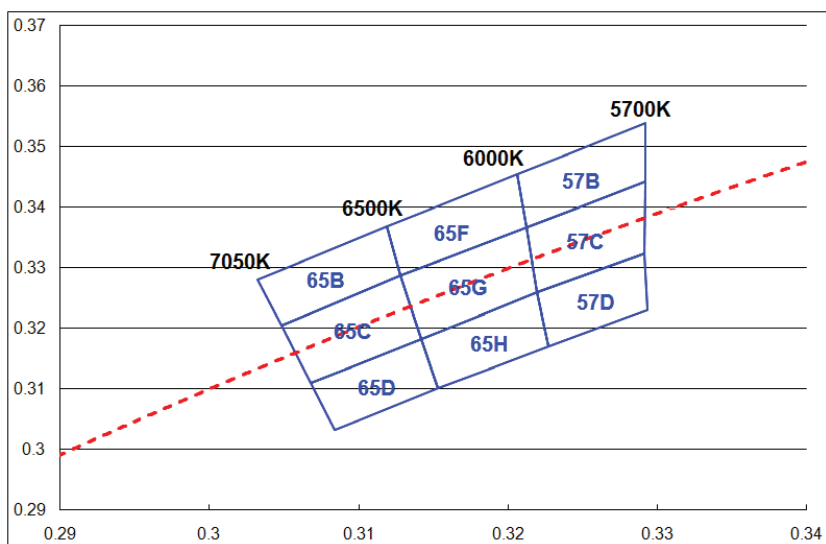


Table 9. CIE rank

Bin	Chromaticity Coordinate				
	CIE_x	CIE_y	CIE_z	CIE_u	CIE_v
65B	0.3032	0.328	0.3048	0.3128	0.3119
	0.3048	0.3205	0.3068	0.3142	0.3128
65C	0.3048	0.3205	0.3068	0.3142	0.3128
	0.3068	0.311	0.3084	0.3153	0.3142
65D	0.3068	0.311	0.3084	0.3153	0.3142
	0.311	0.3032	0.31	0.3182	0.3182
65F	0.3119	0.3369	0.3128	0.3212	0.3206
	0.3128	0.3288	0.3142	0.3219	0.3212
65G	0.3128	0.3288	0.3142	0.3219	0.3212
	0.3142	0.3182	0.3153	0.3227	0.3219
65H	0.3142	0.3182	0.3153	0.3227	0.3219
	0.3182	0.31	0.31	0.317	0.326
57B	0.3206	0.3454	0.3212	0.3292	0.3292
	0.3212	0.3367	0.3219	0.3291	0.3292
57C	0.3212	0.3367	0.3219	0.3291	0.3292
	0.3219	0.326	0.326	0.3324	0.3443

Neutral White

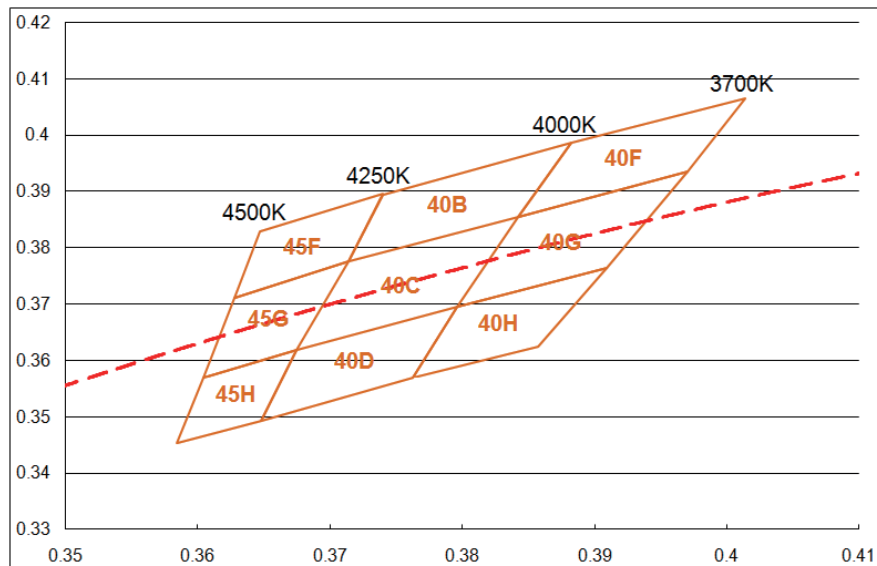


Table 10. CIE rank

Bin	Chromaticity Coordinate				
45E	CIE X	0.3667	0.3647	0.374	0.3765
	CIE Y	0.3944	0.3828	0.3895	0.4016
45F	CIE X	0.3647	0.3628	0.3714	0.374
	CIE Y	0.3828	0.3711	0.3775	0.3895
45G	CIE X	0.3628	0.3604	0.3675	0.3714
	CIE Y	0.3711	0.357	0.3619	0.3775
45H	CIE X	0.3604	0.3584	0.3648	0.3675
	CIE Y	0.357	0.3454	0.3492	0.3619
40A	CIE X	0.3765	0.374	0.3882	0.3915
	CIE Y	0.4015	0.3894	0.3987	0.4114
40B	CIE X	0.374	0.3714	0.3842	0.3882
	CIE Y	0.3894	0.3775	0.3855	0.3987
40C	CIE X	0.3714	0.3675	0.3796	0.3842
	CIE Y	0.3775	0.3619	0.3696	0.3855
40D	CIE X	0.3675	0.3648	0.3763	0.3796
	CIE Y	0.3619	0.3492	0.3569	0.3696
40E	CIE X	0.3915	0.3882	0.4014	0.4056
	CIE Y	0.4114	0.3987	0.4065	0.4198
40F	CIE X	0.3882	0.3842	0.397	0.4014
	CIE Y	0.3987	0.3855	0.3935	0.4065
40G	CIE X	0.3842	0.3796	0.3909	0.397
	CIE Y	0.3855	0.3696	0.3764	0.3935
40H	CIE X	0.3796	0.3763	0.3857	0.3909
	CIE Y	0.3696	0.3569	0.3625	0.3764

Warm White

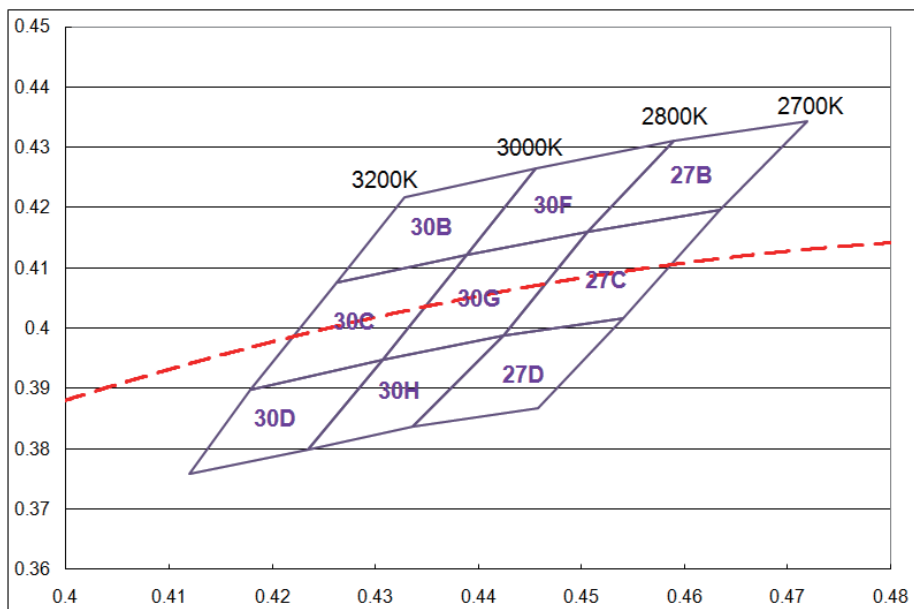


Table 11. CIE rank

Bin	Chromaticity Coordinate				
30B	CIE X	0.4328	0.4263	0.4389	0.4456
	CIE Y	0.4217	0.4076	0.4122	0.4265
30C	CIE X	0.4263	0.4179	0.4307	0.4389
	CIE Y	0.4076	0.3898	0.3948	0.4122
30D	CIE X	0.4179	0.412	0.4235	0.4307
	CIE Y	0.3898	0.3758	0.3799	0.3948
30F	CIE X	0.4456	0.4389	0.4506	0.459
	CIE Y	0.4265	0.4122	0.4159	0.4311
30G	CIE X	0.4389	0.4307	0.4424	0.4506
	CIE Y	0.4122	0.3948	0.3987	0.4159
30H	CIE X	0.4307	0.4235	0.4336	0.4424
	CIE Y	0.3948	0.3799	0.3836	0.3987
27B	CIE X	0.459	0.4506	0.4634	0.4719
	CIE Y	0.4311	0.4159	0.4197	0.4344
27C	CIE X	0.4506	0.4424	0.4541	0.4634
	CIE Y	0.4159	0.3987	0.4016	0.4197
27D	CIE X	0.4424	0.4336	0.4458	0.4541
	CIE Y	0.3987	0.3836	0.3868	0.4016

Product Packaging Information

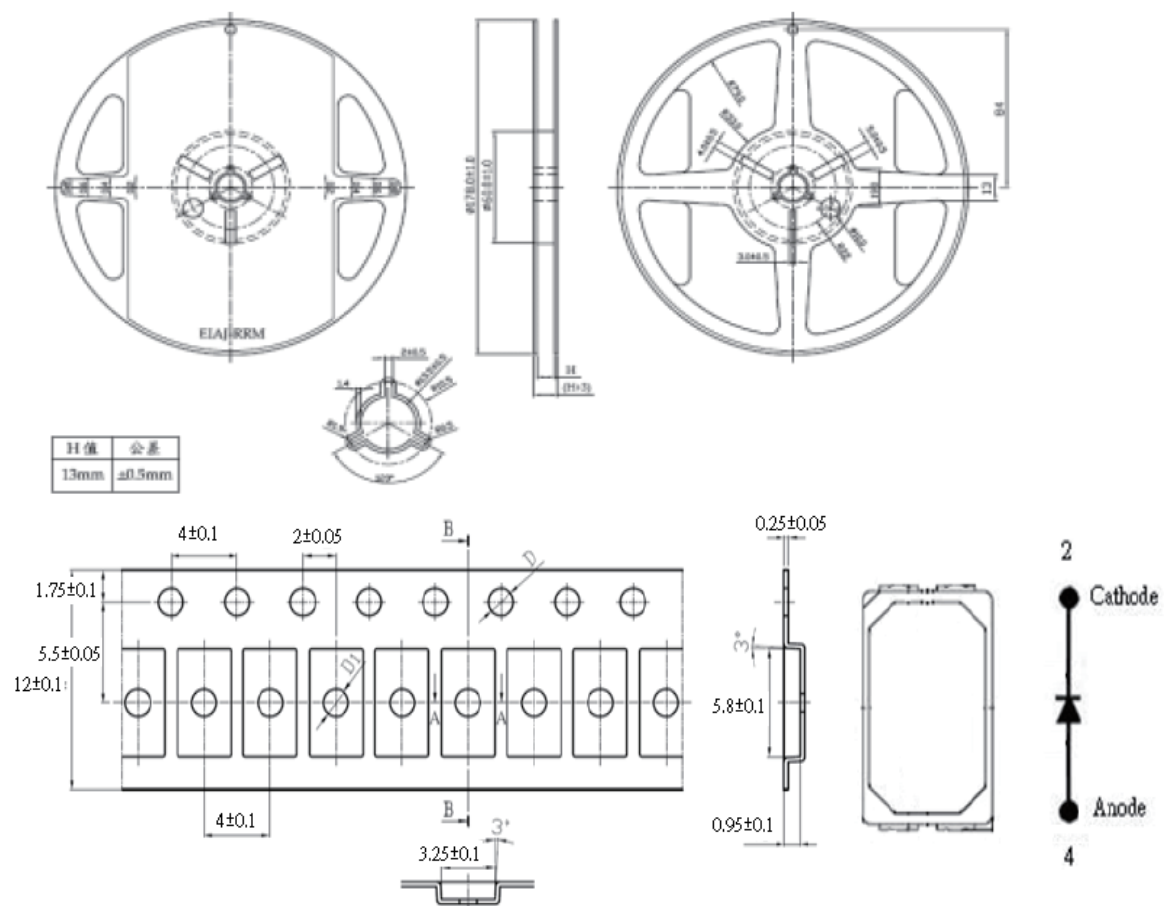


Figure 7. Taping reel dimensions

Packaging

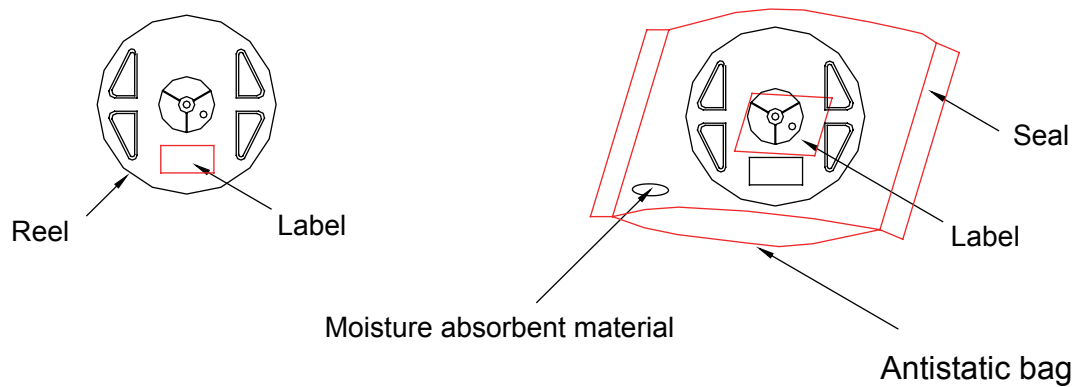


Figure 8. Taping reel dimensions

Package Label



EDISON OPTO CORPORATION

P/N: XX-XXXXX-XXXX



Group: XX-XX-XX

RoHS
Directive Compliance



Lot No: XXXXXXXX

QTY: xxxxPCS




Color: XXXXXXXX

QC: _____

Figure 9. Package label

Table 12. Package dimensions and quantity

Item	Quantity	Total	Dimensions(mm)
Reel	2,000pcs	2,000pcs	Diameter=178
Carton	36 reels	72,000pcs	488*260*364

Revision History

Table 13. Revision history of PLCC 5630 series datasheet

Versions	DESCRIPTION	RELEASE DATE
1	Establish a datasheet	2011/11/11
2	1. Update Absolute Maximum rating 2. update luminous intensity 3. Update CIE chromaticity diagram	2012/01/16
3	1. Revise the Product Nomenclature 2. Revise the LED Package Dimension 3. Revise the Luminous flux	2012/05/02
4	Update the LED Package Label.	2012/07/27

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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