

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)



Lighting Design Manufacturing Service

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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

ET		5630		X	-	A	F	1	W
X1		X2		X3		X4	X5	X6	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
EF	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

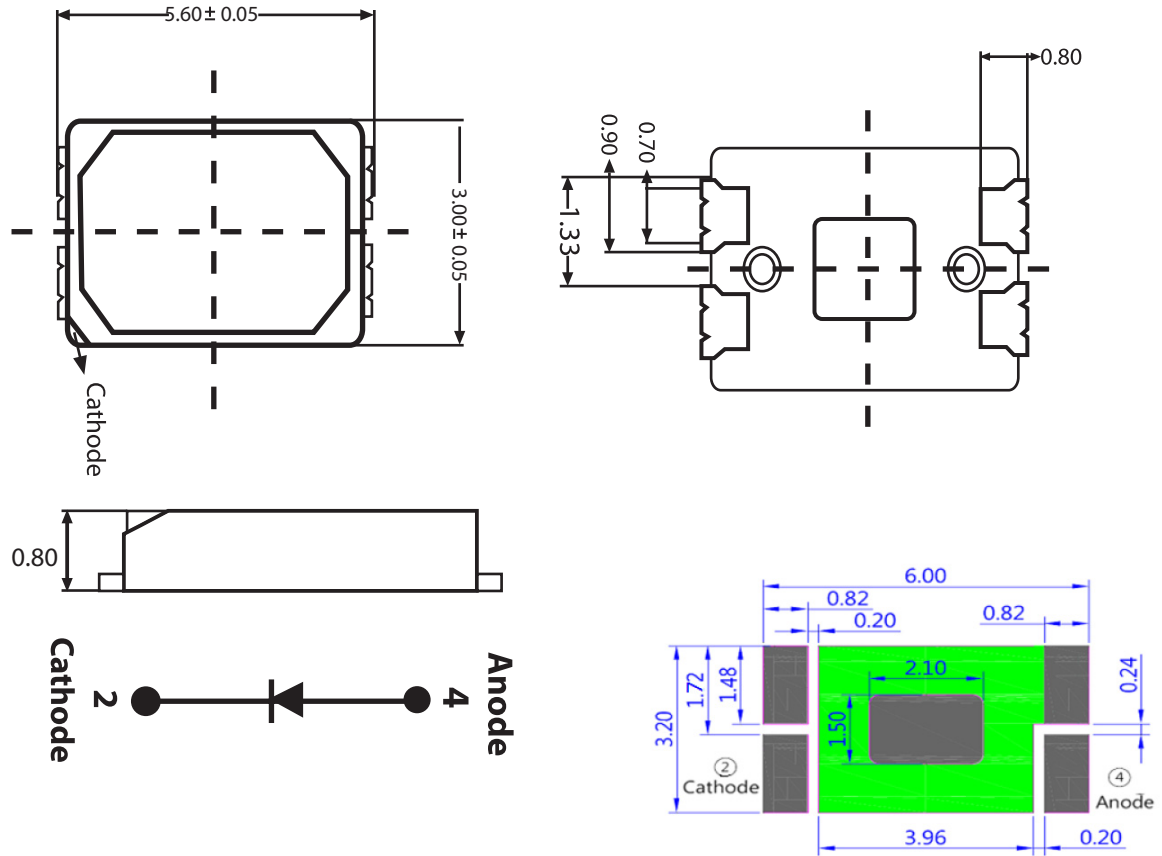


Figure 1. PLCC 5630 series Dimension & circuit diagram

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	°C	T_J
Operating Temperature	-40 ~ +80	°C	
Storage Temperature	-40 ~ +80	°C	
Soldering Temperature	260	°C	
Manual Soldering at 350°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



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Luminous Intensity Characteristics

The following table describes luminous intensity of PLCC 5630 series.

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

Part Name	Color	Min. Luminous intensity@150mA			Forward Current (mA)
		Group	Min. (lm)	Max. (lm)	
ET-5630W-AF1W	Cool White	N	46.6	51.3	150
		O	51.3	56.4	
ET-5630H-AF1W	Neutral White	N	46.6	51.3	150
		O	51.3	56.4	
ET-5630X-AF1W	Warm White	M	42.4	46.6	150
		N	46.6	51.3	

Note:

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

Characteristic

Optical Characteristics

The following table describes luminous intensity of PLCC 5630 series.

Table 4. PLCC Optical Characteristics

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 $\pm 5\%$



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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

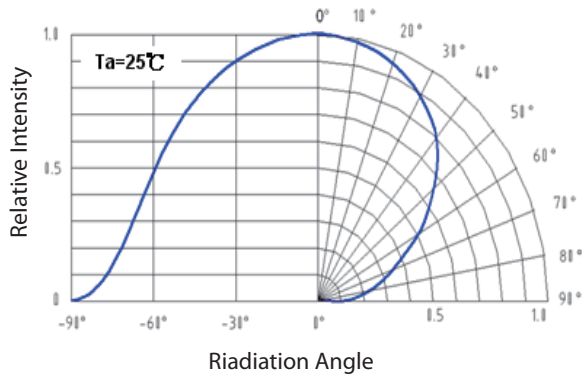


Figure 2. Beam pattern diagram for PLCC 5630 series

Luminous Flux & Wavelength

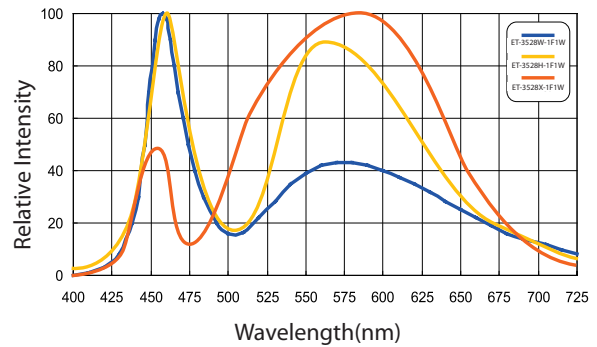


Figure 3. Wavelength & relative intensity for PLCC 5630 series

Forward voltage & Forward current

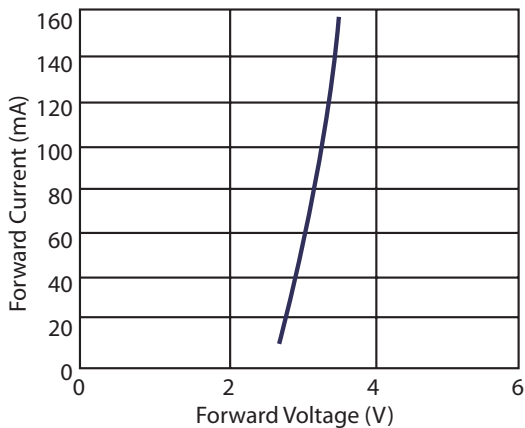


Figure 4. Forward voltage and forward current for PLCC 5630 series

Forward current & Relative Intensity

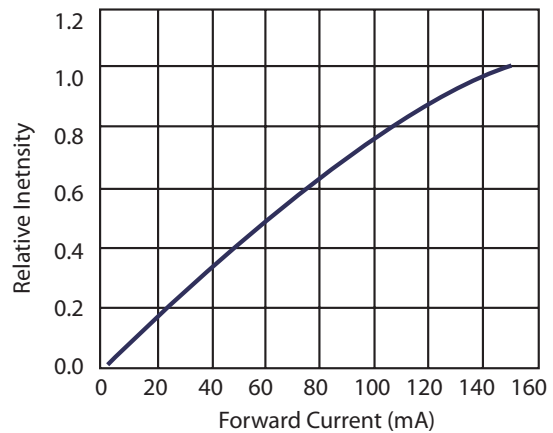


Figure 5. Forward current & relative intensity for PLCC 5630 series

Ambient temperature & Forward current

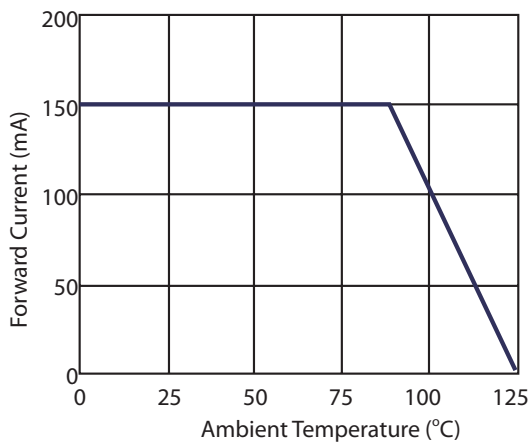


Figure 6. Ambient temperature and forward current for PLCC 5630 series

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	≤30°C / 60% RH	696 +5/-0	30°C / 60% RH	120 +1/-0	60°C / 60% RH

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

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

CIE Chromaticity Diagram

Cool White

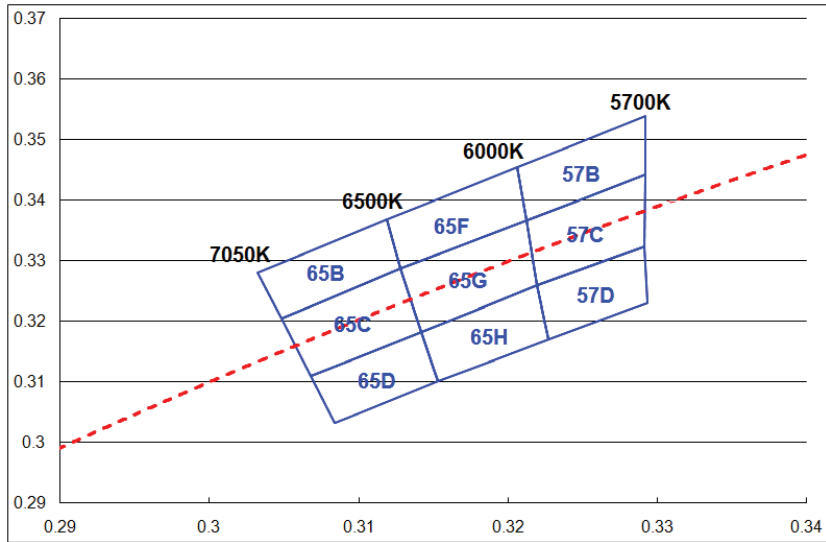


Table 9. CIE rank

Bin	Chromaticity Coordinate				
	CIE_x	CIE_y	CIE_x	CIE_y	CIE_x
65B	CIE_x	0.3032	0.3048	0.3128	0.3119
	CIE_y	0.328	0.3205	0.3288	0.3369
65C	CIE_x	0.3048	0.3068	0.3142	0.3128
	CIE_y	0.3205	0.311	0.3182	0.3288
65D	CIE_x	0.3068	0.3084	0.3153	0.3142
	CIE_y	0.311	0.3032	0.31	0.3182
65F	CIE_x	0.3119	0.3128	0.3212	0.3206
	CIE_y	0.3369	0.3288	0.3367	0.3454
65G	CIE_x	0.3128	0.3142	0.3219	0.3212
	CIE_y	0.3288	0.3182	0.326	0.3367
65H	CIE_x	0.3142	0.3153	0.3227	0.3219
	CIE_y	0.3182	0.31	0.317	0.326
57B	CIE_x	0.3206	0.3212	0.3292	0.3292
	CIE_y	0.3454	0.3367	0.3443	0.3539
57C	CIE_x	0.3212	0.3219	0.3291	0.3292
	CIE_y	0.3367	0.326	0.3324	0.3443

Neutral White

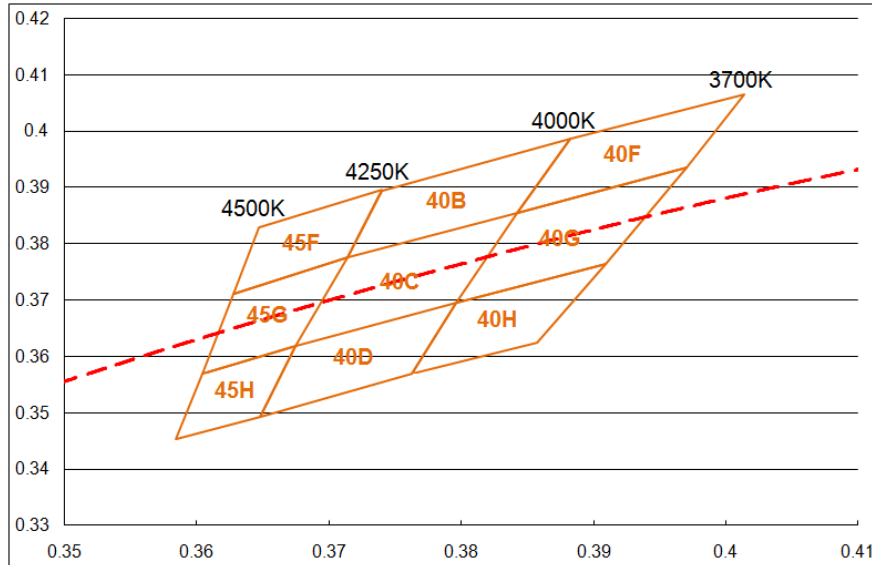


Table 10. CIE rank

Bin	Chromaticity Coordinate				
	CIE X	CIE Y	CIE X	CIE Y	CIE X
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

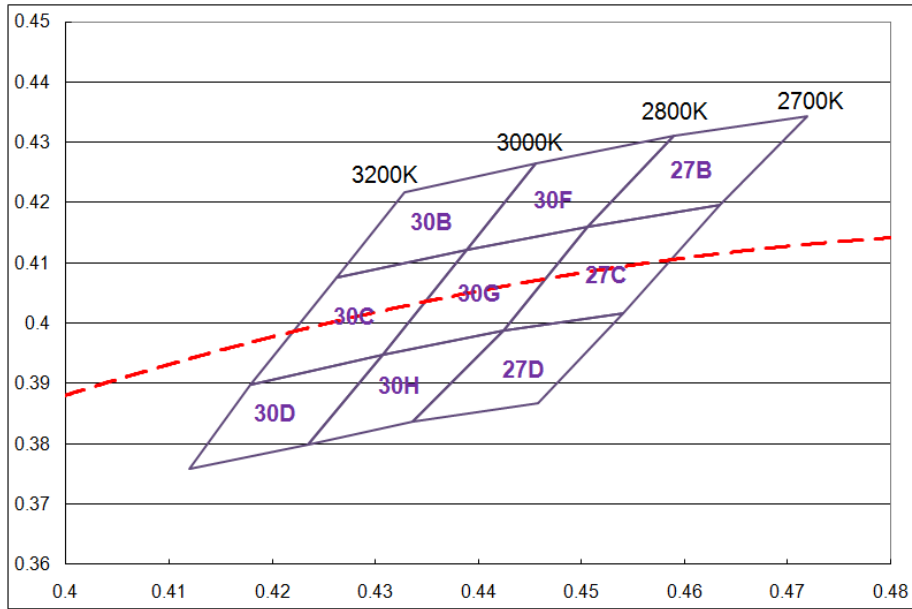


Table 11. CIE rank

Bin	Chromaticity Coordinate					
	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
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

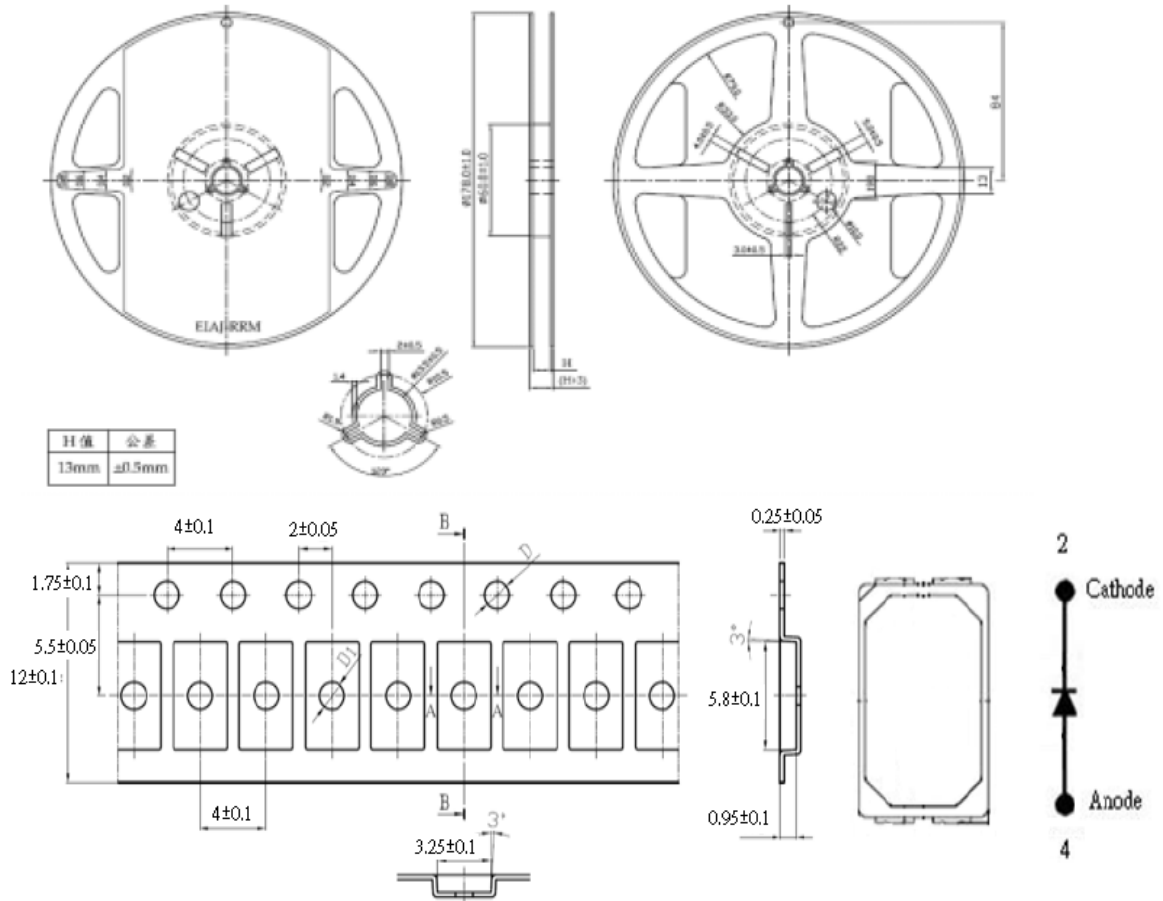


Figure 7. Taping reel dimensions

Packaging

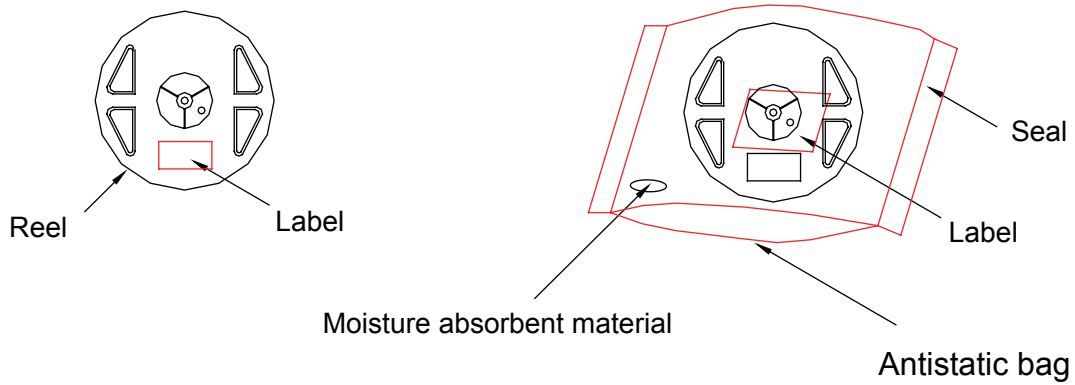


Figure 8. Taping reel dimensions

Package Label

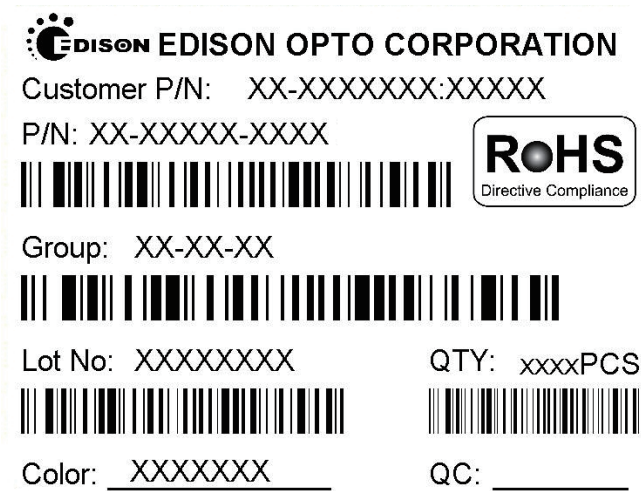


Figure 9. Package label

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



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Revision History

Table 13. Revision history of PLCC 5630 series datasheet

Versions	DESCRIPTION	RELEASE DATE
1	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

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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