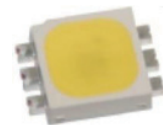


PLCC Series

ET-5050x-BF6W

Datasheet



Features :

- High luminous Intensity and high efficiency
- Based on GaN 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)
- Interior automotive lighting
- Emergency lighting

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General Information

Introduction

High power PLCC is a surface mount, compact, high brightness LED that is built for various illumination needs. A single Cool White high power PLCC can deliver typical luminous flux of 115 lm while driving at 350mA suitable for any kind of lighting sources, including general illumination, flashlights, spotlights, tube light source, freezer lighting, industrial and commercial lightings. The small physical dimension can free customers from any constraints or limitations in these fields of applications. Furthermore, the reflow-solderable nature of high power PLCC provides an easy path towards the optimum thermal management to achieve a promising reliability.

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 5050 series Nomenclature

ET		5050		W		-	B	F	6	W		
X1		X2		X3			X4	X5	X6	X7		
X1 LED Item		X2 Package Type		X3 Emitter Color			X4 Chip Quantity		X5~X6 Serial No.		X7 Feature	
Code	Type	Code	Type	Code	Type		Code	Type	Code	Type	Code	Type
ET	Edison Top LED	5050	5.0X5.0mm	W	Cool White		A	0.5W			W	White surface
				H	Neutral White		B	1W				
				X	Warm White							
				R	Red							
				A	Amber(590nm)							
				T	True Green							
				B	Blue							
				RTB	RGB 3 chips							

LED Package Dimension and Polarity

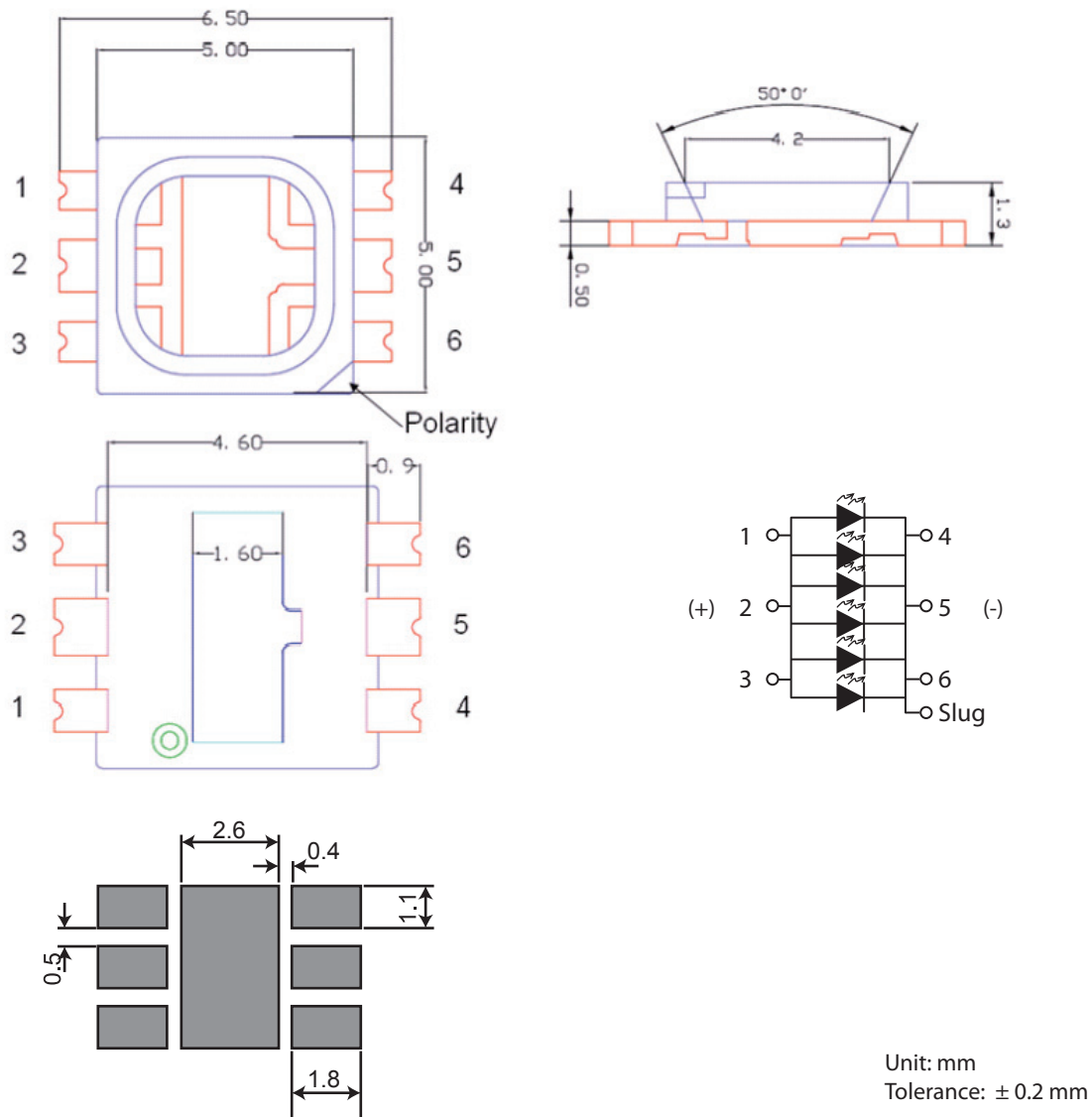


Figure 1. 5050W PLCC Dimension, circuit diagram and recommended soldering pad

Notes:

1. 1W PLCC slug has cathode. (Red and Amber as anode)
2. It is important that the slug cannot contact aluminum surface, it is strongly recommended that there should coat a uniform electrically isolated heat dissipation film on the aluminum surface.

Absolute Maximum Ratings

The following table describe absolute maximum ratings of PLCC 5050 series.

Table 2 . Absolute maximum ratings for PLCC 5050 series

Parameter	Rating	Units	Symbol
Forward Current	350	mA	I_F
Pulse Forward Current	1000	mA	I_{pulse}
Reverse Voltage	5	V	V_R
LED Junction Temperature	125	°C	T_J
Operating Temperature	-30 ~ +85	°C	-
Storage Temperature	-40 ~ +120	°C	-
ESD Sensitivity (HBM)	2,000	V	V_B
Soldering Temperature	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.
3. tp: Pulse width time

Luminous Flux Characteristics

The following table describes luminous Flux of PLCC 5050 series.

Table 3. Luminous Flux characteristics at Ta=25°C for PLCC 5050 series

Part Name	Color	Luminous Flux (lm)			Unit
		Group	Min.	Max.	
ET-5050W-BF6W	Cool White	U3	100	112.5	lm
		V1	112.5	129.4	
		V2	129.4	146.2	
ET-5050H-BF6W	Neutral White	U3	100	112.5	lm
		V1	112.5	129.4	
		V2	129.4	146.2	
ET-5050X-BF6W	Warm White	U2	90	100	lm
		U3	100	112.5	
		V1	112.5	129.4	

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

Characteristic

Optical Characteristics

The following table describes CCT of PLCC 5050 series

Table 4. Optical characteristics at $I_f=30\text{mA}$ and $T_a=25^\circ\text{C}$

Part Name	Color	V_F (V)			CRI	Viewing Angle (Degree)
		Min.	Typ.	Max.		
ET-5050W-BF6W	Cool White	5,000	--	10,000	70	120
ET-5050H-BF6W	Neutral White	3,800	--	5,000	75	120
ET-5050X-BF6W	Warm White	2,670	--	3,800	80	120

Note: CRI is measured with an accuracy of ± 5

Electrical Characteristics

The following table describes forward voltage of PLCC 5050 series

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

Part Name	Color	V_F			Forward Current (mA)	Thermal Resistance ($^\circ\text{C}/\text{W}$)
		Min.	Typ.	Max.		
ET-5050W-BF6W	Cool White	2.8	--	4.0	350	10
ET-5050H-BF6W	Neutral White	2.8	--	4.0	350	10
ET-5050X-BF6W	Warm White	2.8	--	4.0	350	10

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
V01	$I_f=350\text{mA}$	2.8	3.1	V
V02		3.1	3.4	
V03		3.4	3.7	
V04		3.7	4.0	

Note:

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

Reliability Test Items

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

Test 1⁽¹⁾: JEDEC LEVEL 2a Test

Stress Test	Stress Conditions	Duration	Failure Criteria
Temperature and Humidity	60°C/ 60%RH	120 Hr(<0.5W) 168 Hr(≥0.5W)	No Catastrophes
IR reflow	Peak temp. = 255~260°C/ <10 Sec.	3 Times	No Catastrophes

Test 2: Other Test

Stress Test	Stress Conditions	Duration	Failure Criteria
Room Temperature Operating Life	25°C, $I_F = I_{DCmax}$ (2)	1000 Hours	(3)
High Temperature High Humidity Operating Life	85°C/ 85%RH, $I_F = I_{DCmax} \times 0.5$	1000 Hours	(3)
High Temperature Storage Life	85°C	1000 Hours	(3)
Low Temperature Storage Life	-40°C	1000 Hours	(3)
Non-Operating Thermal Shock	-40°C/125°C 15 min dwell < 10 sec transfer	1000Hours/ 200 Cycles	No Catastrophes
Non-Operating Thermal Cycle	-40°C/100°C 30 min dwell < 15min transfer	1000Hours/ 200 Cycles	No Catastrophes

Notes:

- Reliability test 2 is performed after reliability test 1.
- DC max is defined to be under the indicated driving current for PLCC respectively/
- Failure Criteria:
 - Electrical failures: VF shifts $\geq 10\%$
 - Light Output Degradation: Percentage level shift $\geq 35\%$ for PLCC<0.5W
 - Light Output Degradation: Percentage level shift $\geq 50\%$ at 1,000hrs or 500cycle for PLCC $\geq 0.5W$
 - Visual failures: Broken or damaged package on lens or substrate

Characteristic Curves

Spectrum

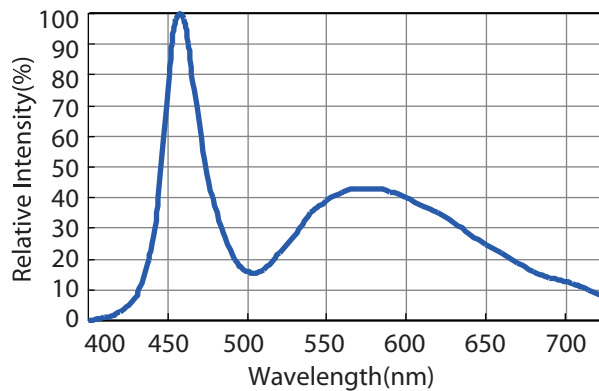


Figure 2. Color Spectrum for Cool White at a typical CCT

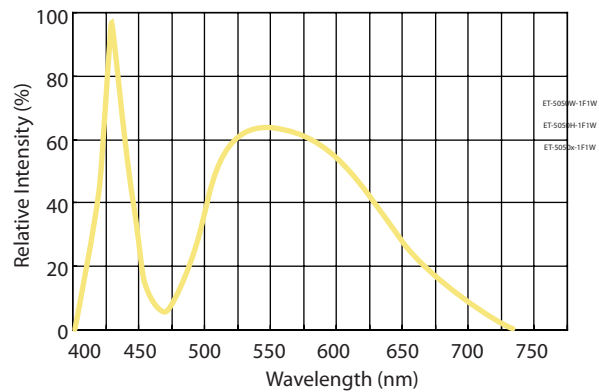


Figure 3. Color Spectrum for Neutral White at a typical CCT

Radiation Diagram

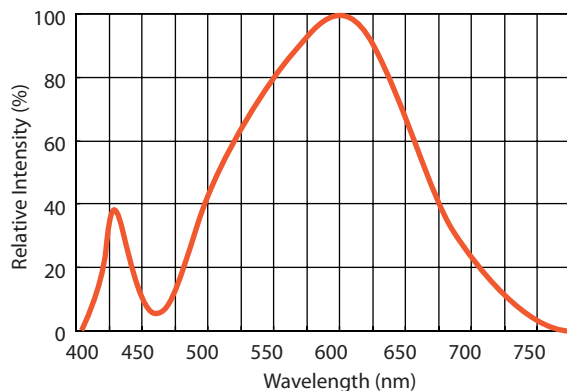


Figure 4. Color Spectrum for Warm White at a typical CCT

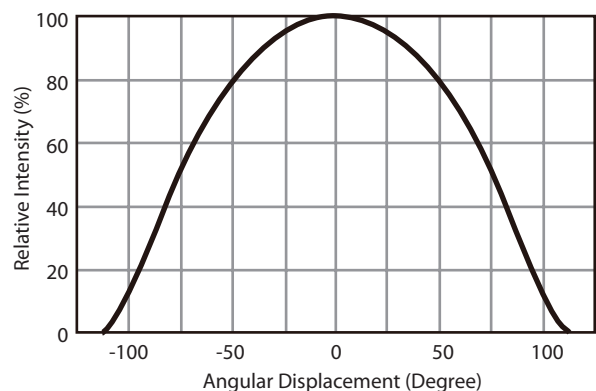


Figure 5. Emission Angle

Forward Voltage & Forward Current

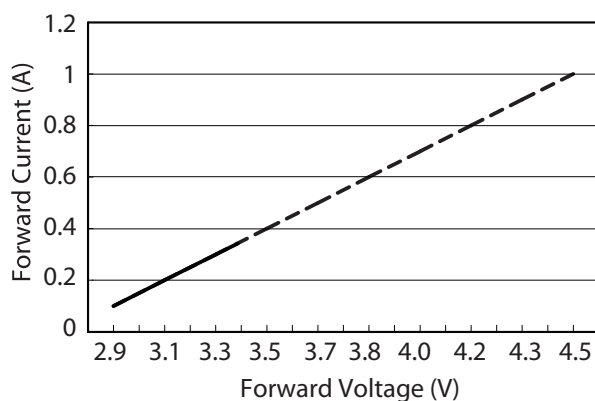


Figure 6. Forward current & forward voltage for 1.1W PLCC

Luminous Flux & Forward Current

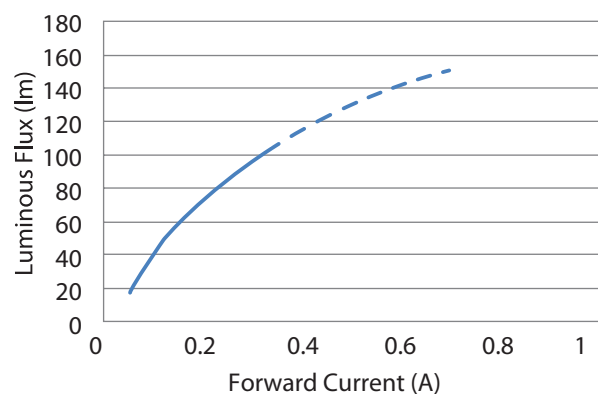


Figure 7. Forward current & relative luminous at $T_a=25^{\circ}\text{C}$ for 1.1W PLCC

CCT & Forward Current

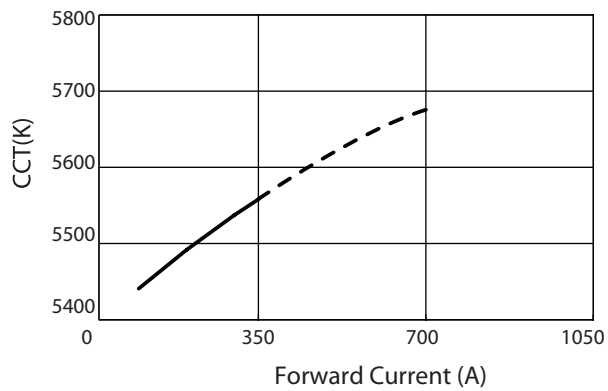


Figure 8. Forward current & CCT at $T_a = 25^\circ\text{C}$ for 1.1W PLCC Cool White

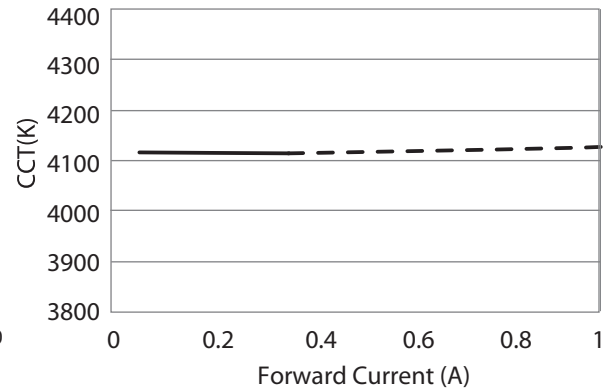


Figure 9. Forward current & CCT at $T_a = 25^\circ\text{C}$ for PLCC Neutral White

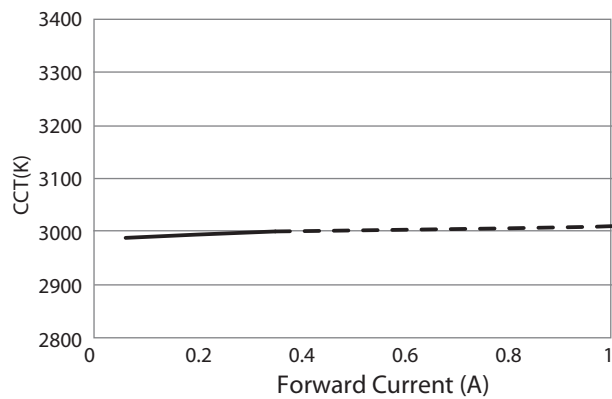
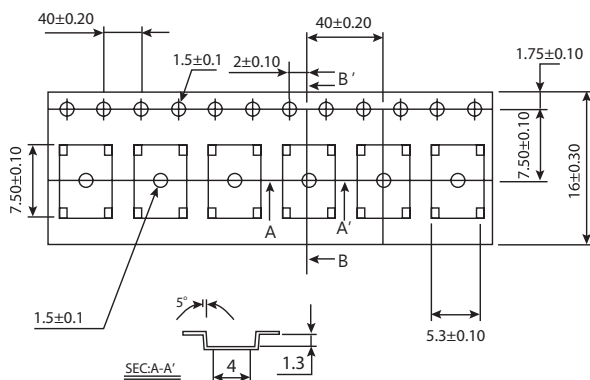


Figure 10. Forward current & CCT at $T_a = 25^\circ\text{C}$ for PLCC Warm White

Product Packaging Information

5050 Diemision



Taping Reel

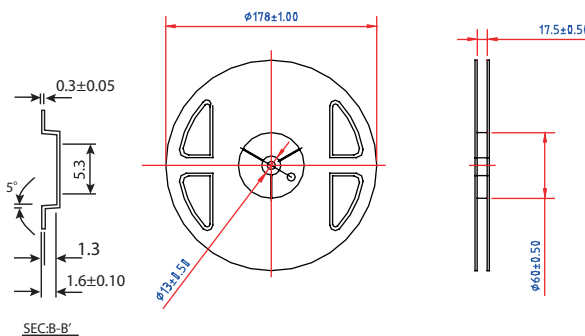
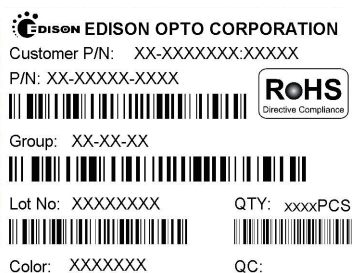


Figure 8. Taping reel dimensions

Package Label



Quantity and Package Dimension

There are two different package quantities for PLCC LEDs. Please confirm the noted quantity before unseal.

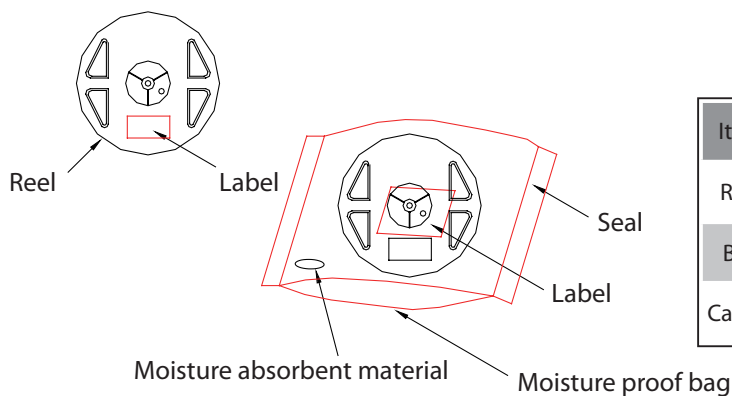


Figure 9. Package label

Table 7. Package dimensions and quantity

Item	Quantity	Total	Dimensions(mm)
Reel	1,000pcs	1,000pcs	Diameter=178
Box	4 reels	4,000pcs	240*235*67mm
Carton	5 boxes	20,000pcs	353*254*256mm

Revision History

Table 8. Revision history of PLCC 5050.

Versions	Modification	Date
1	1. Establish a Datasheet.	2011/07/20
2	1. Update the Luminous Flux Characteristics.	2012/09/05

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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