
PLCC Series

ET-3528x-3x1W Series Datasheet



Features :

- High luminous Intensity and high efficiency
- Based on InGaN / 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

Table of Contents

General Information	3
LED Package Dimension and Polarity	4
Absolute Maximum Ratings	5
Luminous Flux Characteristics	5
Characteristic	6
Forward Voltage Ranks	6
Reliability Test Items	7
Characteristic Curves	8
Product Packaging Information	10
Revision History	11
About Edison Opto	11

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 lighting for building.

Product Nomenclature

The following table describes the available color, package size, and chip quantity.

Table 1. PLCC 3528 series Nomenclature

ET		3528		W		-		3		B		1		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	Code	Type	Code	Type
ET	Edison Top LED	3528	3.5X2.8mm	W	Cool White	3	3pcs					W	White surface		
				H	Neutral White										
				X	Warm White										

LED Package Dimension and Polarity

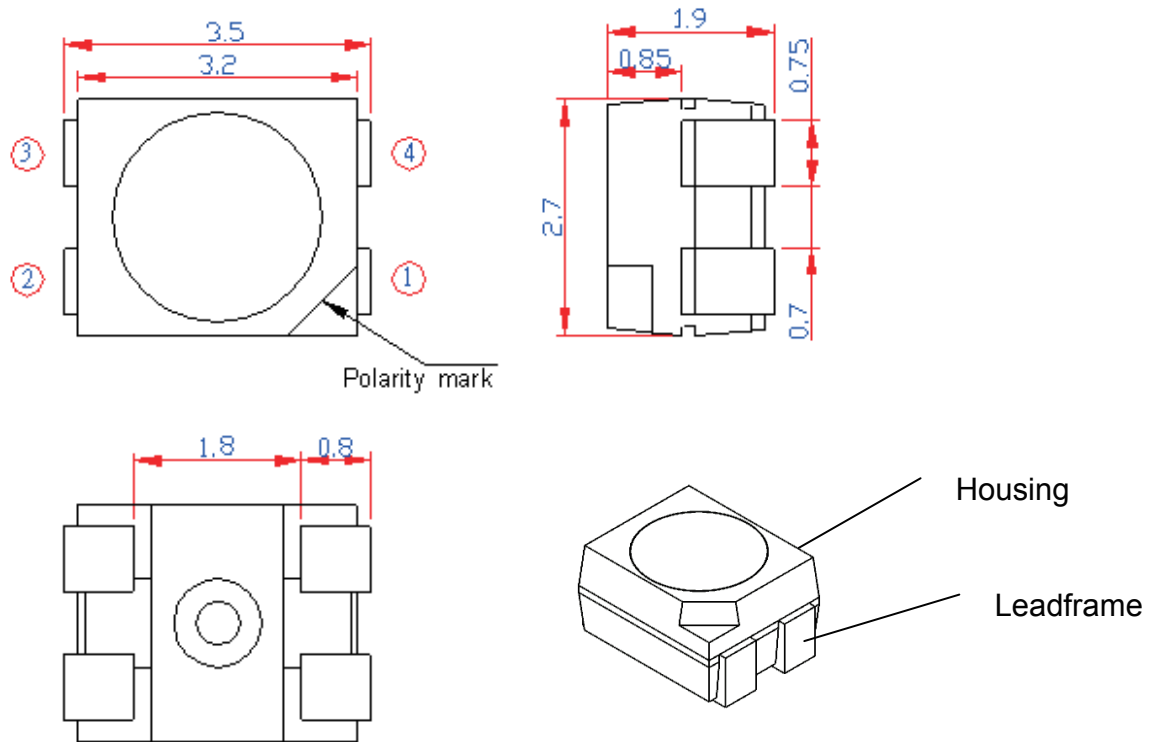


Figure 1. PLCC 3528 series Dimension

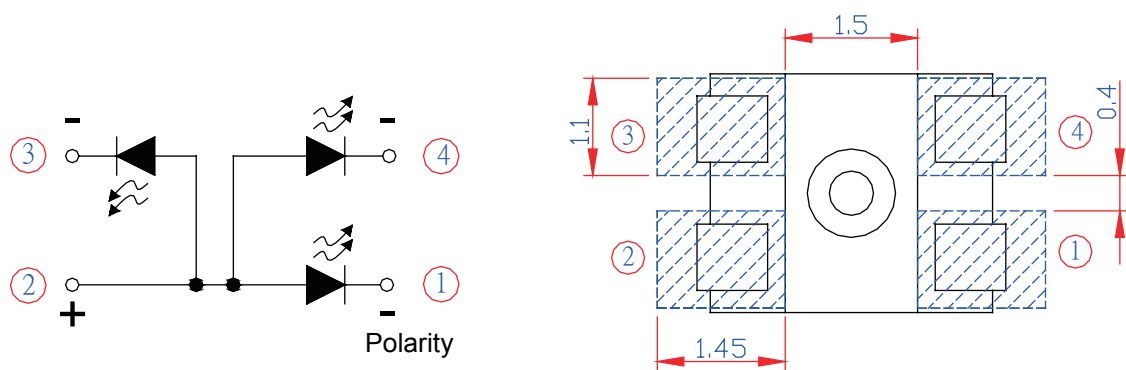


Figure 2. PLCC 3528 series circuit diagram and recommended soldering pad

Notes:

1. All dimensions are measured in mm.
2. Tolerance : ± 0.2 mm

Absolute Maximum Ratings

The following table describe absolute maximum ratings of PLCC 3528 series.

Table 2 . Absolute maximum ratings for PLCC 3528 series

Parameter	Rating	Units	Symbol
Forward Current	30	mA	I_F
Pulse Forward Current ($t_p \leq 100\mu s$, Duty cycle=0.25)	100	mA	-
Reverse Voltage	5	V	V_R
Forward Voltage	3.8	V	V_F
LED Junction Temperature	125	$^{\circ}C$	T_J
Operating Temperature	-30 ~ +85	$^{\circ}C$	-
Storage Temperature	-40 ~ +100	$^{\circ}C$	-
Soldering Temperature	255~260	$^{\circ}C$	-
Manual Soldering at 350 $^{\circ}C$ (Max.)	3	Sec	-

Notes:

1. Above values are based on one chip performance.
2. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
3. LEDs are not designed to be driven in reverse bias.
4. t_p : Pulse width time.

Luminous Flux Characteristics

The following table describes luminous Flux of PLCC 3528 series.

Table 3. Luminous Flux characteristics at $T_a=25^{\circ}C$ for PLCC 3528 series

Part Name	Color	Luminous Flux (lm)			Luminous Intensity Typ.(mcd)	Forward Current (mA)
		Group	Min.	Max.		
ET-3528W-3B1W	Cool White	ZO	13.6	16.6	60	7,300
		ZP	16.6	20.3		
		ZQ	20.3	24.5		
ET-3528H-3E1W	Neutral White	ZO	13.6	16.6	60	7,000
		ZP	16.6	20.3		
		ZQ	20.3	24.5		
ET-3528X-3E1W	Warm White	ZO	13.6	16.6	60	6,000
		ZP	16.6	20.3		

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

Characteristic

Optical Characteristics

The following table describes CCT of PLCC 3528 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-3528W-3B1W	Cool White	5,000	--	10,000	70	120
ET-3528H-3E1W	Neutral White	3,800	--	5,000	75	120
ET-3528X-3E1W	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 3528 series

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

Part Name	Color	V_F (V)	
		Min.	Max.
ET-3528W-3B1W	Cool White	2.8	4.0
ET-3528H-3E1W	Neutral White	2.8	4.0
ET-3528X-3E1W	Warm White	2.8	4.0

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
UJ	$I_f=60\text{mA}$	2.8	3.0	V
UK		3.0	3.2	
UL		3.2	3.4	
UM		3.4	3.6	
UN		3.6	3.8	
UO		3.8	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 ≥ 10%
 - Light Output Degradation: Percentage level shift ≥ 35% for PLCC < 0.5W
 - Light Output Degradation: Percentage level shift ≥ 50% at 1,000hrs or 500cycle for PLCC ≥ 0.5W
 - Visual failures: Broken or damaged package on lens or substrate

Characteristic Curves

Spectrum

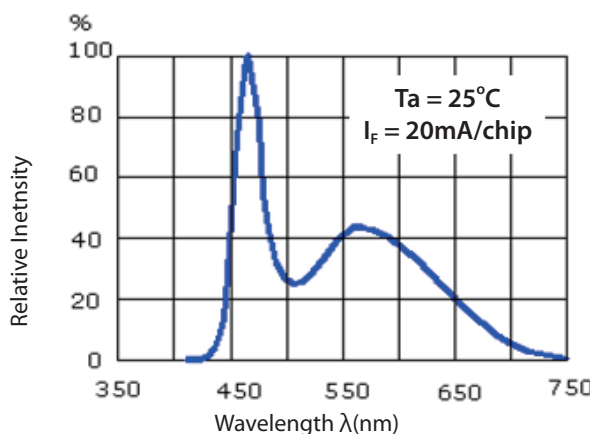


Figure 3. Wavelength & relative intensity for PLCC 3528 series cool white.

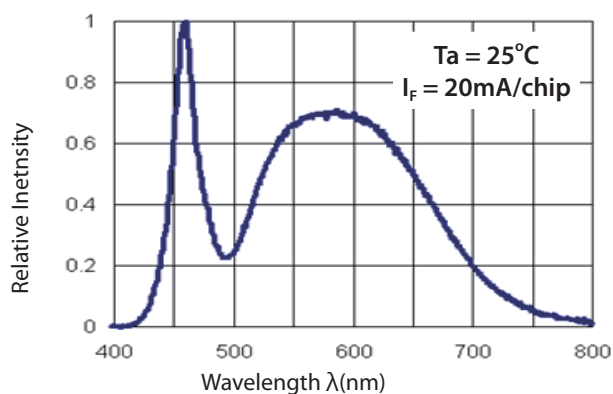


Figure 4. Wavelength & relative intensity for PLCC 3528 series neutral white.

Radiation Diagram

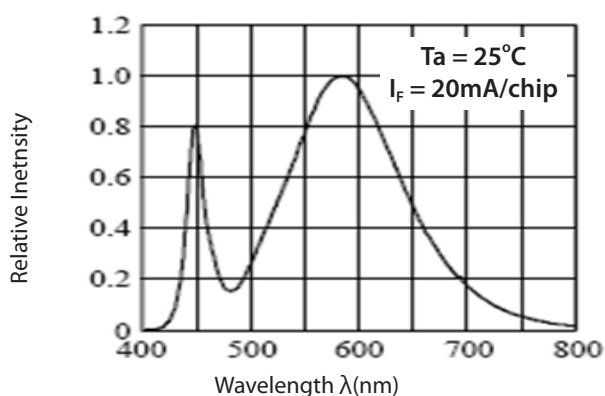


Figure 5. Wavelength & relative intensity for PLCC 3528 series warm white

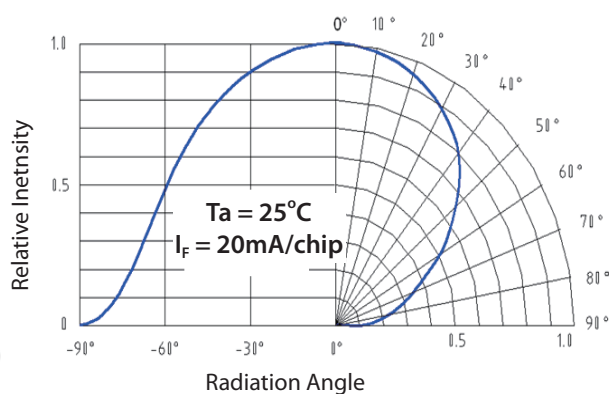


Figure 6. Beam pattern diagram for PLCC 3528 series

Luminous Flux & Forward Current

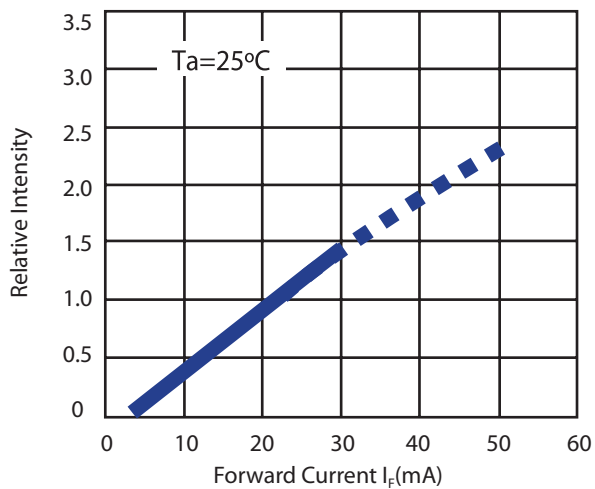


Figure 7. Forward current & relative intensity for PLCC 3528 series

Forward Voltage & Forward Current

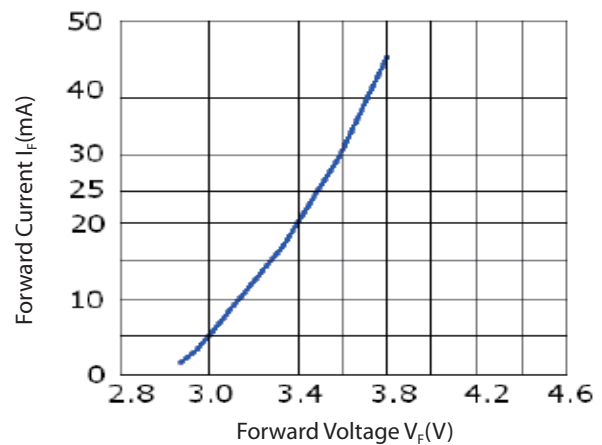


Figure 8. Forward current & forward voltage for PLCC 3528 series

Luminous Flux & Ambient Temperature

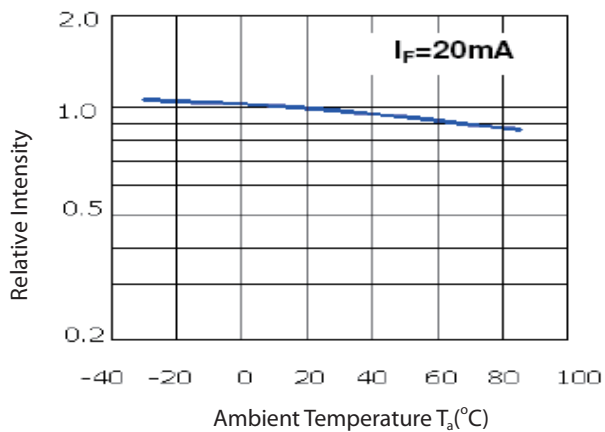
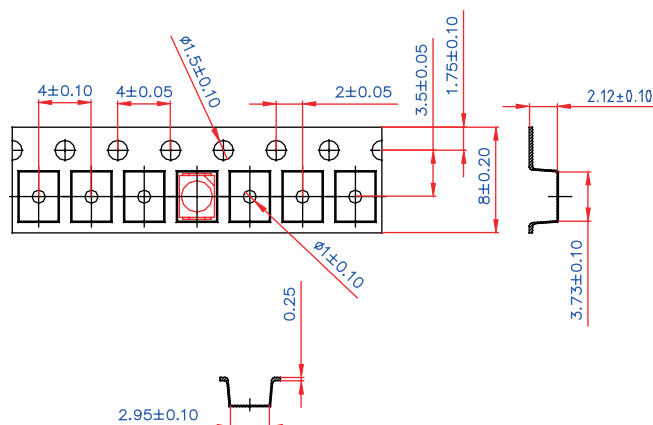


Figure 9. Ambient temperature & relative intensity for PLCC 3528 series

Product Packaging Information

3528 Diemision



Taping Reel

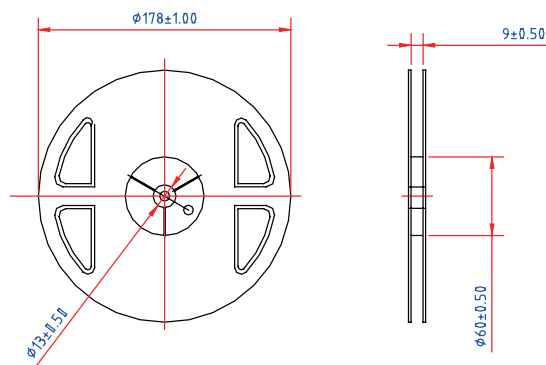
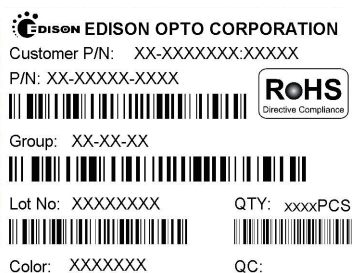


Figure 10. Taping reel dimensions

Package Label



Quantity and Package Dimension

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

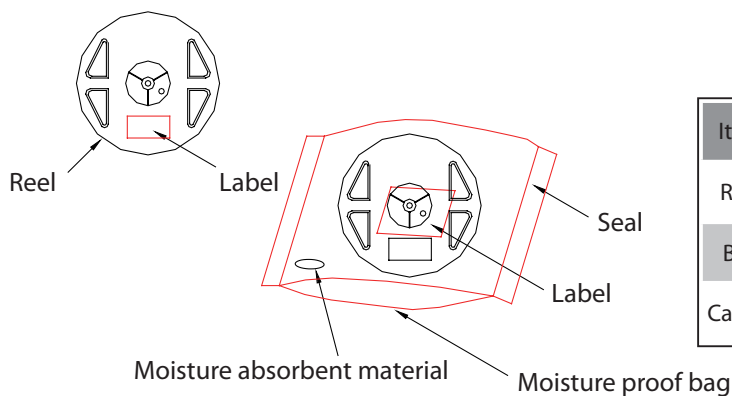


Figure 11. Package label

Table 7. Package dimensions and quantity

Item	Quantity	Total	Dimensions(mm)
Reel	2,000pcs	2,000pcs	Diameter=178
Box	5 reels	10,000pcs	240*235*67mm
Carton	5 boxes	50,000pcs	353*254*256mm

Revision History

Table 8. Revision history of PLCC 3528.

Versions	Modification	Date
1.	Establish a datasheet	2009/02/26
2.	Update Typical and Lumen on p.8	2009/03/27
3.	1.Update Product Nomenclature 2.Update CRI	2010/03/08
4.	Update graphics	2010/08/19
5.	Update version	2010/03/23
6.	1. Update the layout of datasheet 2. combine ET-3528W-3B1W, ET-3528H-3E1W and ET-3528X-3E1W to one file	2011/10/18
7	1. Update the Luminous Intensity Characteristic	2012/09/06

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

Copyright©2012 Edison Opto. All rights reserved. No part of publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photo copy, recording or any other information storage and retrieval system, without prior permission in writing from the publisher. The information in this publication are subject to change without notice.

www.edison-opto.com

For general assistance please contact:
service@edison-opto.com.tw

For technical assistance please contact:
LED.Detective@edison-opto.com.tw