



**THE DATASHEET OF
ESS-3528TWD**



Jiangsu Everstar Electronics Co., Ltd.

Address:No.6 Xiangshan Rd, Tianmuhu Industry Park, Liyang City, Jiangsu Province, China

TEL: +86-519-87557772

FAX: +86-519-87557773

Http: www.everstarelect.com

DATA SHEET

ESL NO.. : ESS-3528TWD

CUS NO. :

REV : A / 0

Producer: *Eden*

Auditor: _____

Approver: *Jack*

CUSTOMER'S APPROVAL : _____

DCC : _____

3528 SMD LED

ESS-3528TWD

REV:A / 0

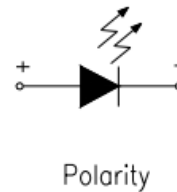
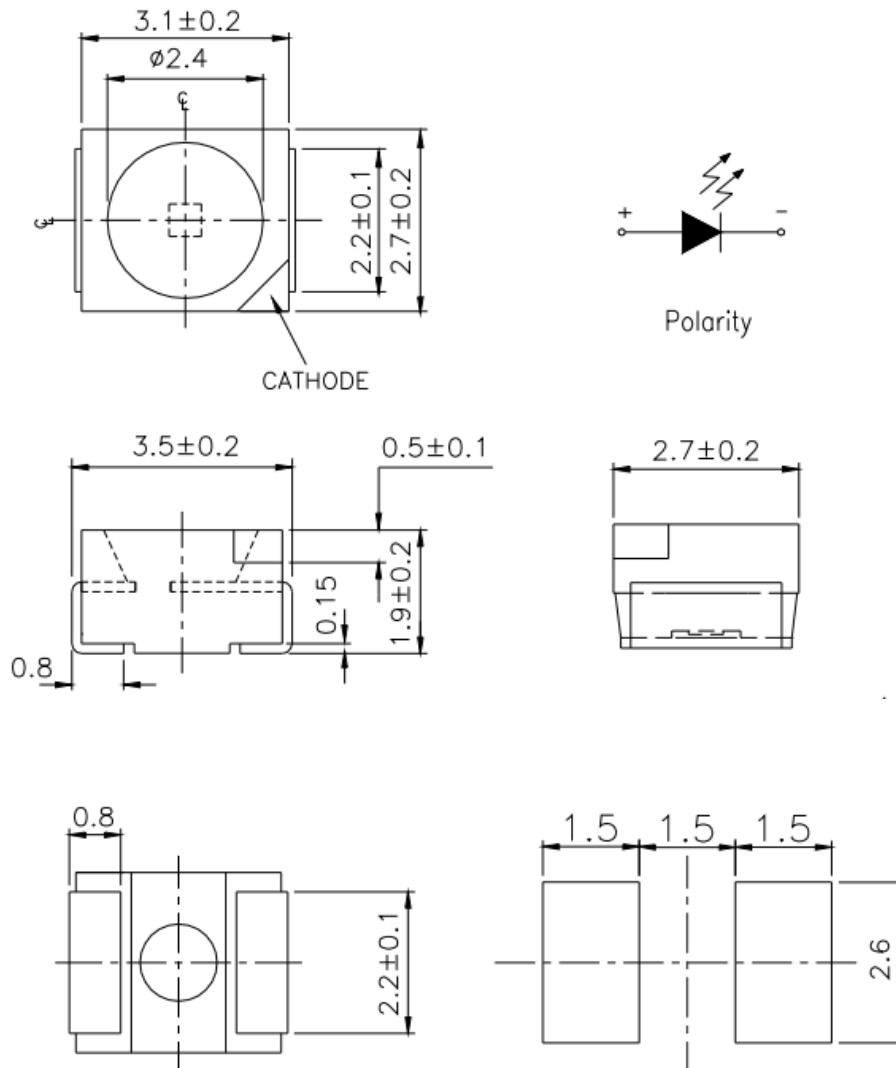
※ Features:

1. Compatible with automatic placement equipment
2. Compatible with reflow solder process
3. This product doesn't contain restriction Substance, comply ROHS standard.

※ Applications:

1. Automotive and Telecommunication
2. General use for indicators

※ Package Outline Dimension:



Unit:mm

Tolerance: ± 0.2 mm unless otherwise noted Electrodes: Ag Plating Copper Alloy

Encapsulating Resin: Silicon Resin Package: Heat-Resistant Polymer

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※ Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	120	mW
Forward Current	I _F	30	mA
Peak Forward Current * 1	I _{FP}	100	mA
Reverse Voltage	V _R	5	V
Operating Temperature	Topr	-40°C~85°C	-
Storage Temperature	Tstg	-40°C~100°C	-

* 1 I_{FP} condition: pulse of 1/10 duty and 0.1ms width.

※ Electrical-optical characteristics(Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V _f	2.8	-	3.3	V	IF=20mA
Luminous Intensity	I _v	2000	-	2750	mcd	
Luminous Intensity	L _m	6.5	-	8.0	lm	
Viewing Angle	2θ _{1/2}	-	120	-	deg	
Reverse Current	I _R	-	-	10	μA	VR=5V
Spectral Line Half Width	Δλ	-	30	-	nm	IF =20mA
Color Rendering Index	R _a	70	-	80	-	IF =20mA
Color Temperature	CCT		6500		k	IF =20mA
Chromaticity Coordinate	-	-	0.31	-	-	IF =20mA
			0.33			

Note: 1. Tolerance of luminous intensity is ±10% 2.Tolerance of forward voltage is ±0.05V

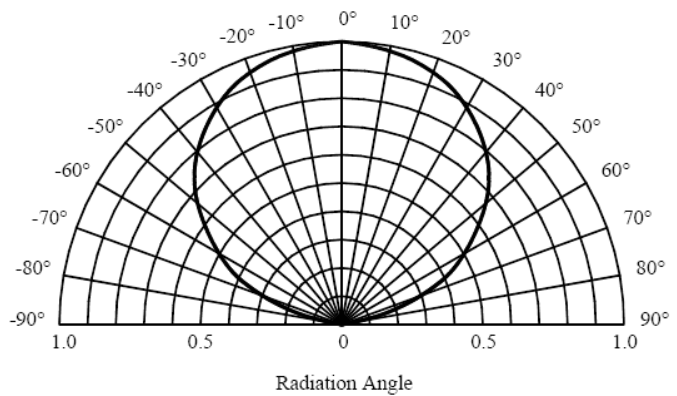
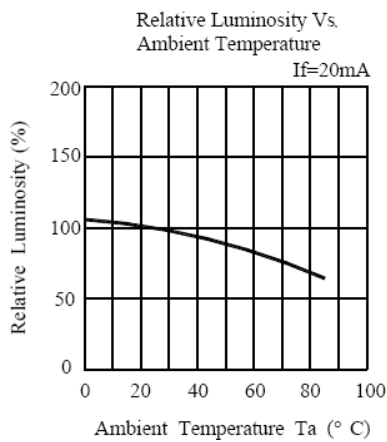
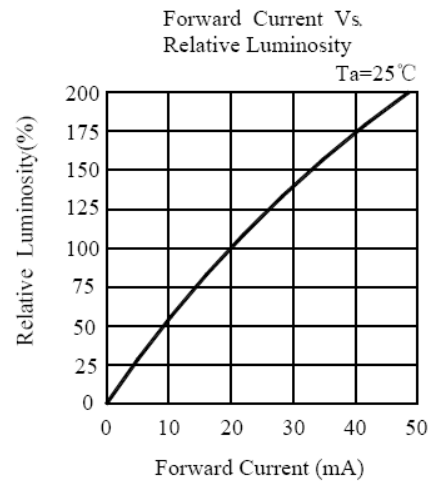
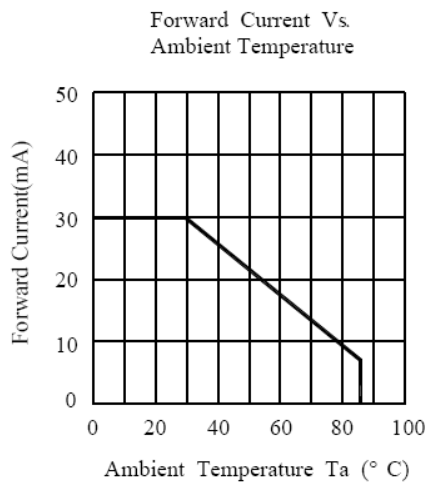
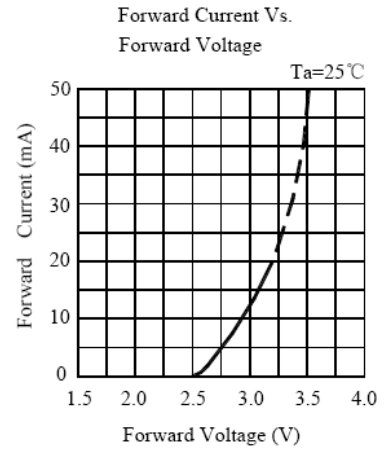
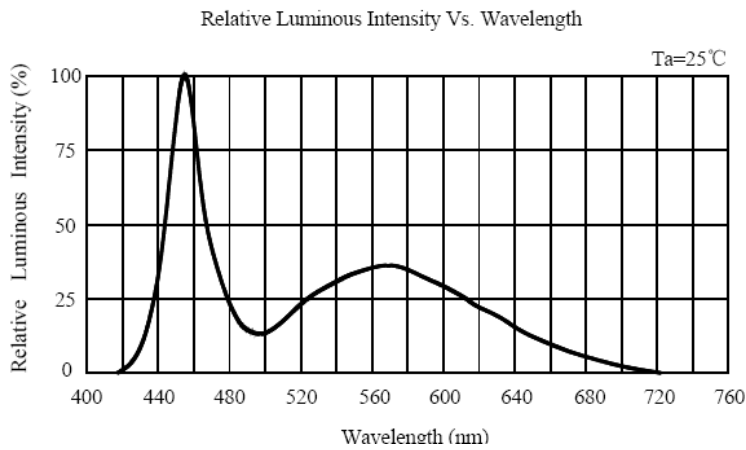
3.Tolerance of Peak Wavelength ±2nm

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※ Typical Electro-Optical Characteristics Curves

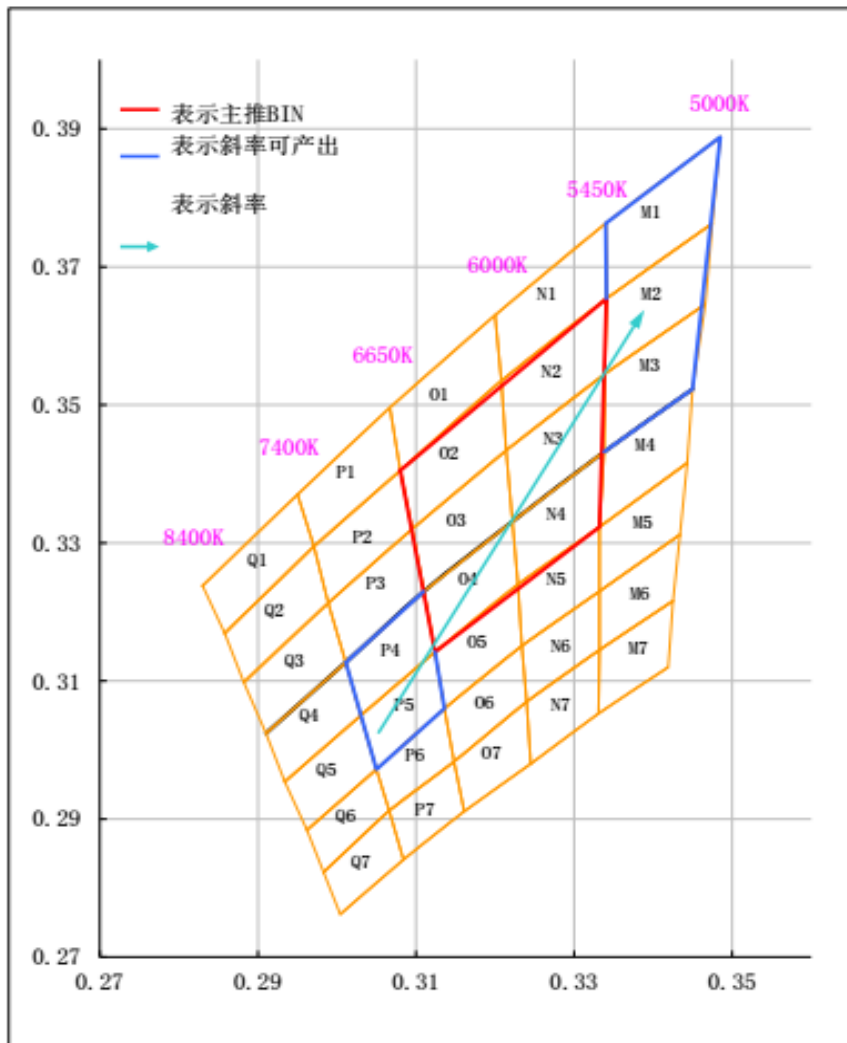


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※ Chromaticity Coordinates & Bin grading diagram: (IF=20mA)



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※BIN range

Forward voltage (tolerance is $\pm 0.05V$ @ $I_F=20mA$):

BIN CODE	Min. (V)	Max. (V)
R	2.8	2.9
S	2.9	3.0
T	3.0	3.1
U	3.1	3.2
V	3.2	3.3

Luminous intensity (tolerance is $\pm 10%$ @ $I_F=20mA$):

BIN CODE	Min.(mcd)	Max.(mcd)
A	2000	2250
B	2250	2500
C	2500	2750



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※Reliability

(1) Test Items and Conditions

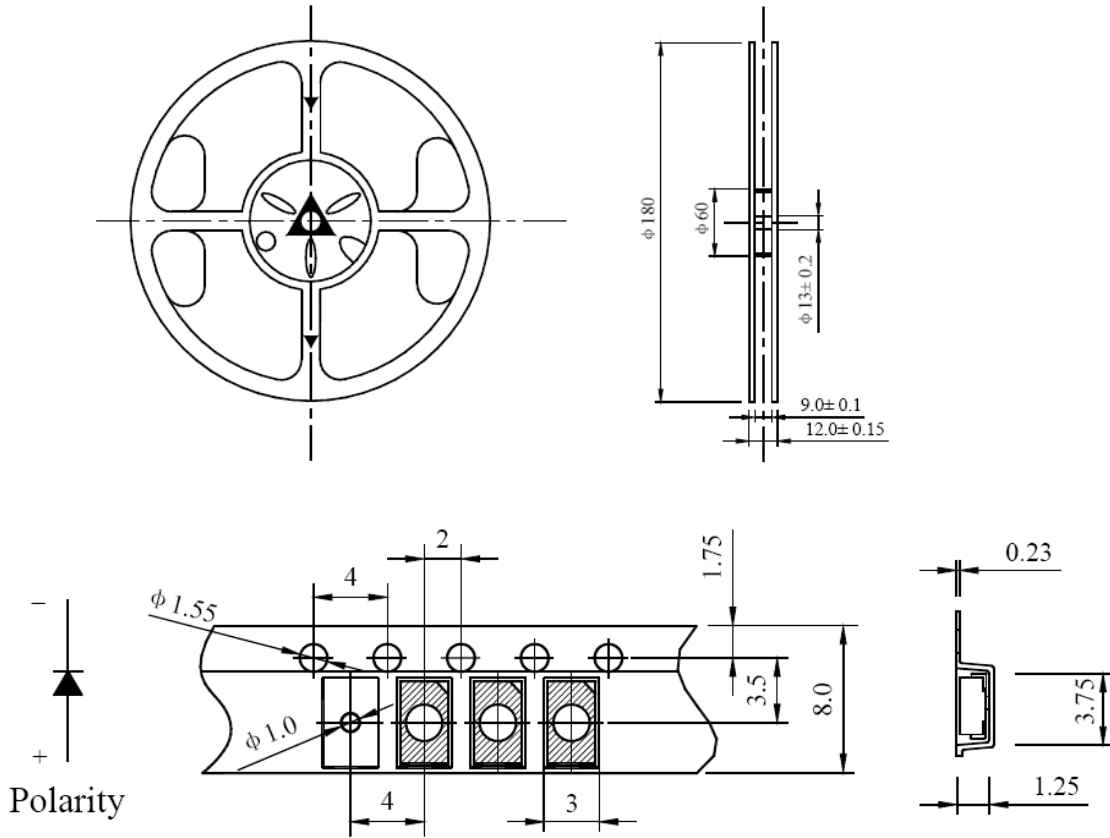
NO	Test Item	Test Conditions	Sample	Ac/ Re
1	Temperature Cycle	-40±5℃→25±5℃→100±5℃→25±5℃ (30min, 5min, 30min, 5min) 100 Cycles	20	0/1
2	High Temperature Storage	Ta: 100±5℃ Test time=1000HRS(-24HRS,+72HRS)	20	0/1
3	High Temperature And High Humidity Working	Ta: 85±5℃, RH:85±5%, If=20mA Test time=500HRS(-24HRS,+72HRS)	20	0/1
4	Low Temperature Storage	Ta: -40±5℃ Test time=1000HRS(-24HRS,+72HRS)	20	0/1
5	Operating Life Test	Connect with a power If=20mA Ta=Under room temperature Test time=1000HRS(-24HRS,+72HRS)	20	0/1
6	Thermal Shock	-40±5℃→100±5℃ (15min, 15min) 100 Cycles	20	0/1
7	IR-Reflow Pb-Free Process	①80℃②100℃③120℃④160℃⑤170℃ ⑥235℃⑦270℃⑧255℃, 60cm/min, 2 times	20	0/1

(2)Criteria of judging the damage

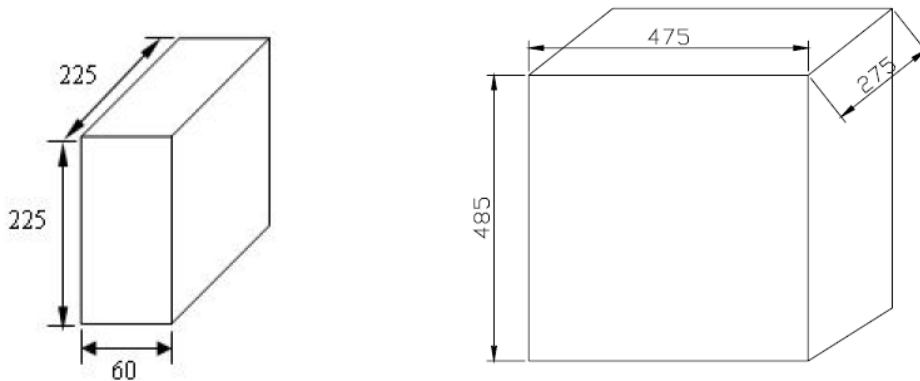
Item	Symbol	Test condition	Criteria for judgement	
			Min.	Max.
Forward voltage	V _F	I _F =Test Current	/	U.S.L*1.1
Reverse current	I _R	V _R =5V	/	15uA
Luminous intensity	I _V	I _F =Test Current	L.S.L*0.7	/
Wave length	λ D/ λ P	I _F =Test Current	/	U.S.L±2nm
Appearance	/	View check	No mechanical damage	

U.S.L: Upper standard level L.S.L: Lower standard level

※ Package Tape Specifications: (2000 pcs/Reel)



Reel Lead Min.60mm No LEDs



※ Precautions for Use

1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

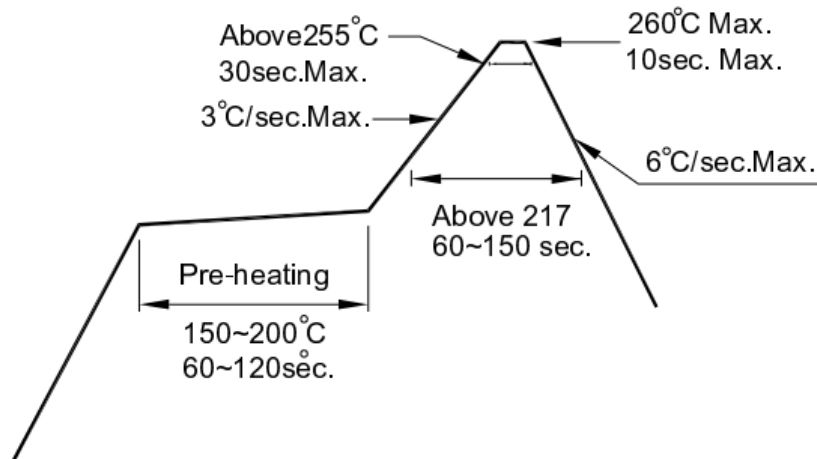
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 60±5°C for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

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