

# ET-3528W-3B1W



## Features

- High Luminous Intensity and High Efficiency
- Base 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 and Outdoor Displays
- Backlighting (illuminated advertising, general lighting)
- Interior Automotive Lighting
- Emergency lighting



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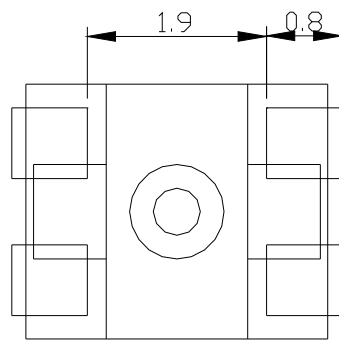
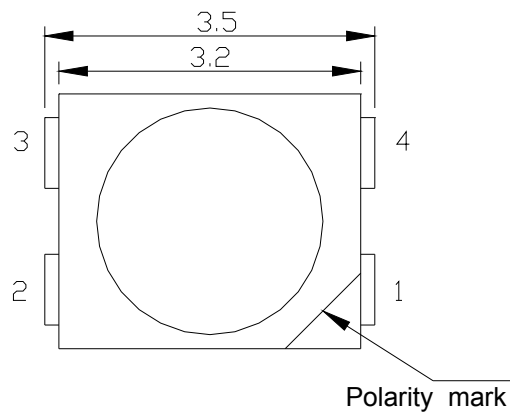
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## Outline Dimension

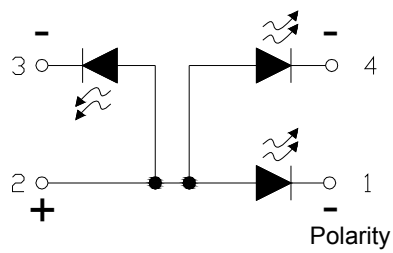
### Package Outlines



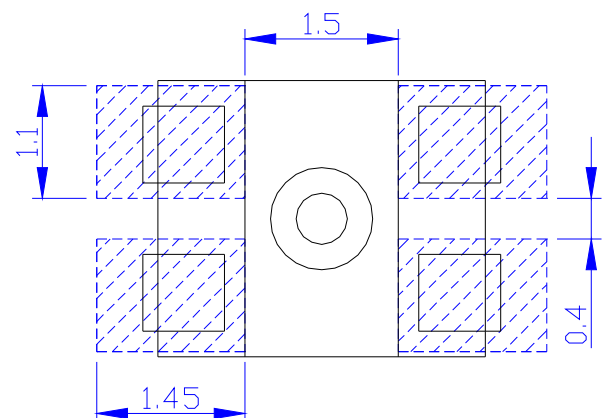
Unit : mm

Tolerance :  $\pm 0.2$  mm

### Circuit Diagram



### Recommended Soldering Pad



## Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Value	Unit
Forward Current	I <sub>F</sub>	30	mA
Pulse Forward Current	I <sub>FP</sub>	100	mA
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>d</sub>	75	mW
Operating Temperature	T <sub>op</sub>	-30 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
Soldering Temperature	T <sub>sld</sub>	Reflow Soldering : 255~260°C/10~30sec Manual Soldering : 350°C/3sec	

- The values are based on 1-die performance.

- I<sub>FP</sub> condition : pulse width ≤ 0.1msec. and duty ≤ 1/10.

## Electro-Optical Characteristics(Ta=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage(per die)	V <sub>F</sub>	I <sub>F</sub> =20mA	2.8	-	3.8	V
Reverse Current(per die)	I <sub>R</sub>	V <sub>R</sub> =5V	-	-	10	μA
Luminous Intensity	I <sub>v</sub>	I <sub>F</sub> =60mA	2150	-	5950	mcd
Viewing Angle	2θ <sub>1/2</sub>	I <sub>F</sub> =60mA	-	120	-	deg.
Chromaticity Coordinates	X	I <sub>F</sub> =60mA	0.258	-	0.33	-
	Y	I <sub>F</sub> =60mA	0.273	-	0.33	-

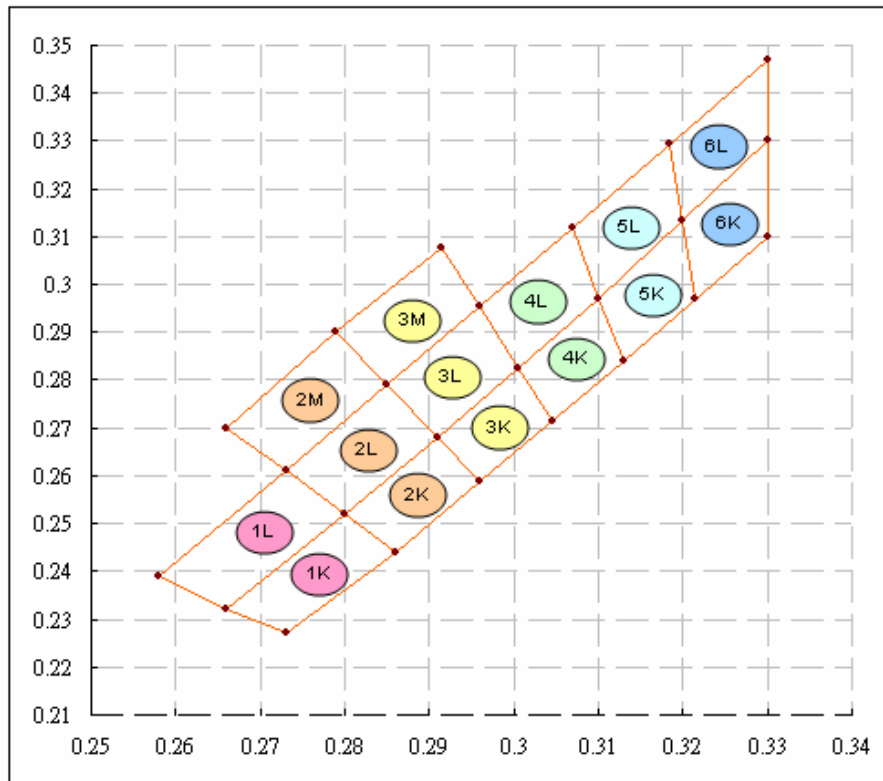
- 2θ<sub>1/2</sub> is the off-axis angle where the luminous intensity is half of the axial luminous intensity.

## V<sub>F</sub> Rank(Ta=25°C)

Bin	Condition	Min	Max	Unit
UJ	I <sub>F</sub> =20mA	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	

- Forward voltage measurement allowance is ± 0.1V.

## CIE Chromaticity Diagram



## Luminous Intensity Rank(Ta=25°C)

Bin	Condition	Min	Max	Unit
ZK	I <sub>F</sub> =60mA	2150	2650	mcd
ZL		2650	3250	
ZM		3250	3950	
ZN		3950	4850	
ZO		4850	5950	

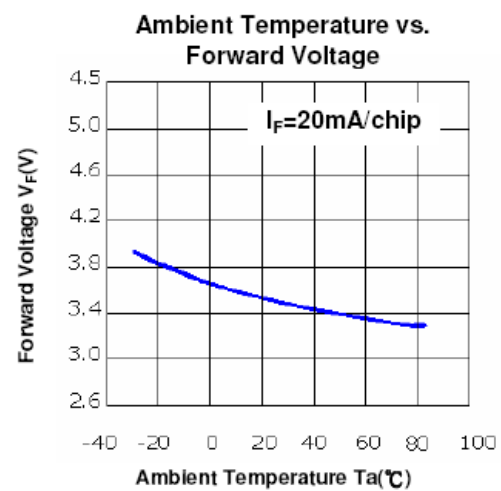
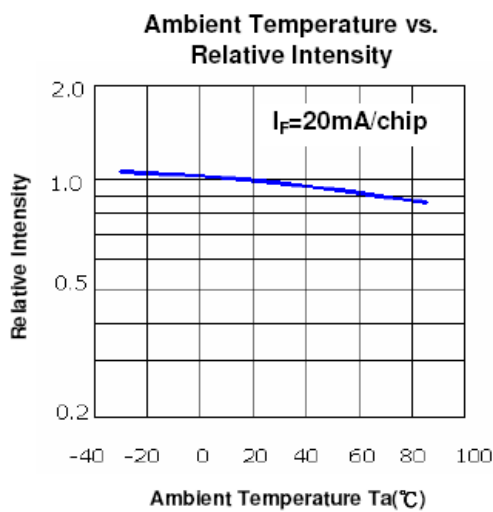
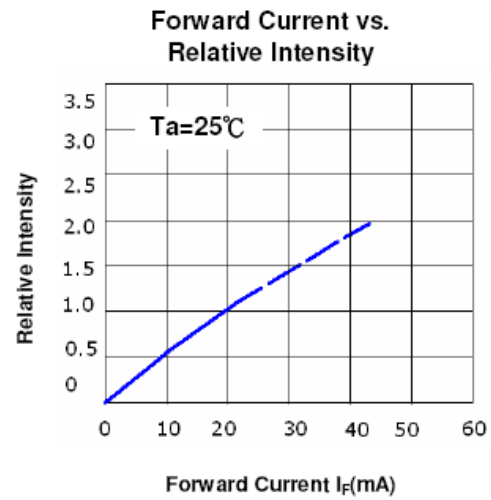
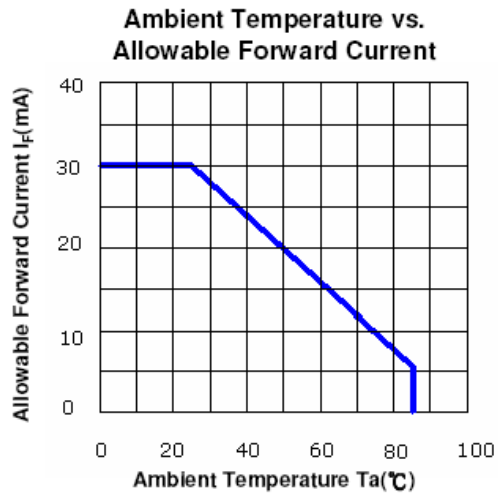
- Luminous Intensity Measurement Allowance is ± 10%.

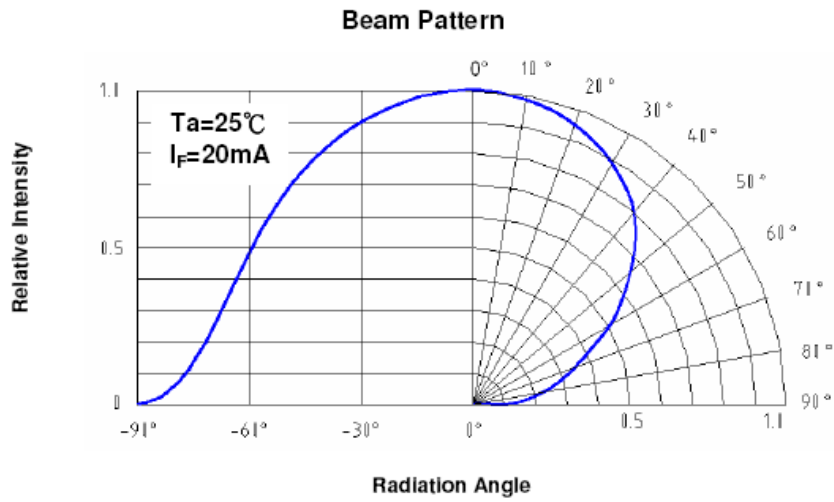
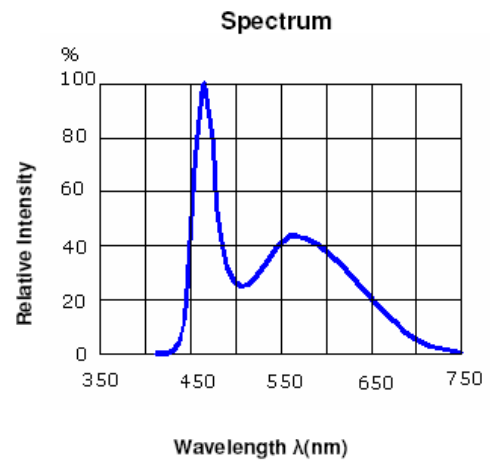
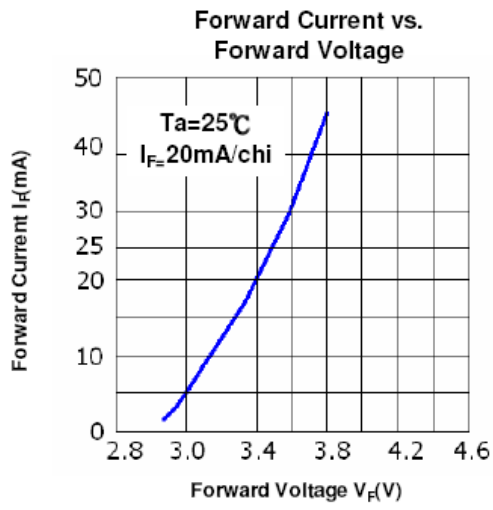
**Color Bin( $I_F=60\text{mA}$  ,  $T_a=25^\circ\text{C}$ )**

Bin	Chromaticity Coordinate				
	X	Y	Z	u'	v'
1K	X	0.273	0.266	0.28	0.286
	Y	0.227	0.232	0.252	0.244
1L	X	0.266	0.258	0.273	0.28
	Y	0.232	0.239	0.261	0.252
2K	X	0.286	0.28	0.291	0.296
	Y	0.244	0.252	0.268	0.259
2L	X	0.28	0.273	0.285	0.291
	Y	0.252	0.261	0.279	0.268
2M	X	0.273	0.266	0.279	0.285
	Y	0.261	0.27	0.29	0.279
3K	X	0.296	0.291	0.3005	0.3045
	Y	0.259	0.268	0.2825	0.2715
3L	X	0.291	0.285	0.296	0.3005
	Y	0.268	0.279	0.2955	0.2825
3M	X	0.285	0.279	0.2915	0.296
	Y	0.279	0.29	0.3075	0.2955
4K	X	0.3045	0.3005	0.31	0.313
	Y	0.2715	0.2825	0.297	0.284
4L	X	0.3005	0.296	0.307	0.31
	Y	0.2825	0.2955	0.312	0.297
5K	X	0.313	0.31	0.32	0.3215
	Y	0.284	0.297	0.3135	0.297
5L	X	0.31	0.307	0.3185	0.32
	Y	0.297	0.312	0.3295	0.3135
6K	X	0.3215	0.32	0.33	0.33
	Y	0.297	0.3135	0.33	0.31
6L	X	0.32	0.3185	0.33	0.33
	Y	0.3135	0.3295	0.347	0.33

- Color coordinates measurement allowance is  $\pm 0.01$

## Characteristic Curves





## Reliability Test Item and Condition

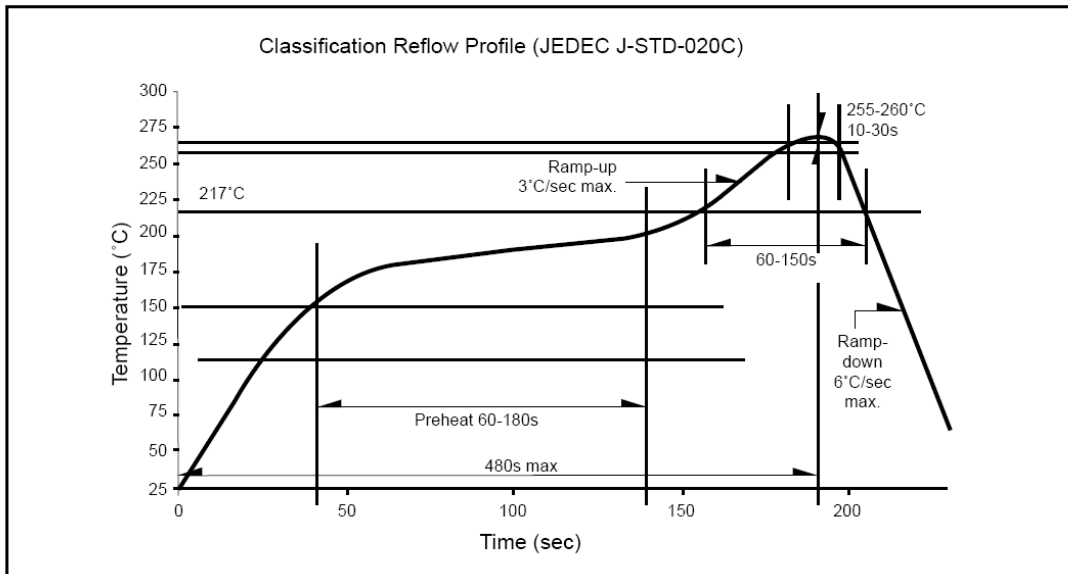
### (1) Test Items and Results

No.	Test Type	Test Conditions	units	Test Point	Failure
1.	IR Reflow	Peak temp.=255~260°C*3 times (Pre treatment 60°C/60%RH,120hrs)	22	before after	C=0
2.	Temperature Cycle (TC)	-40°C to +100°C 30min. 15min. 30min. (Pre treatment 60°C/60%RH,120hrs Reflow peak=255~260°C *3 times)	22	0 cycle 200 cycle	C=0
3.	Thermal Shock (TSK)	-40°C to +100°C 2min. 5s 2min. (Pre treatment 60°C/60%RH,120hrs Reflow peak=255~260°C *3 times)	22	0 cycle 100 cycle	C=0
4.	High Temp. & Hum. Life test (HTHL)	Ta=80°C, 85%RH, If= 20 mA (Pre treatment 60°C/60%RH,120hrs Reflow peak=255~260°C *3 times)	22	0hr 500hrs 1000hrs	C=0
5.	Low Temperature Storage (LTS)	Ta=-40°C (Pre treatment 60°C/60%RH,120hrs Reflow peak=255~260°C *3 times)	22	0hr 500hrs 1000hrs	C=0
6.	High Temp. & Hum. Storage (HTHS)	Ta=85°C, 85%RH (Pre treatment 60°C/60%RH,120hrs Reflow peak=255~260°C *3 times)	22	0hr 500hrs 1000hrs	C=0
7.	Ambient Temp. Life test (ATL)	Ta=25°C, If= 20 mA (Pre treatment 60°C/60%RH,120hrs Reflow peak=255~260°C *3 times)	22	0hr 500hrs 1000hrs	C=0

### (2) Criterial for Failure

Items	Symbol	Condition	Criterial for Failure
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	Shift ≥ 10%
Luminous Intensity	I <sub>V</sub>	I <sub>F</sub> =60mA	Decay ≥ 35%

## Recommended Reflow Soldering Profile



### 1. Soldering conditions

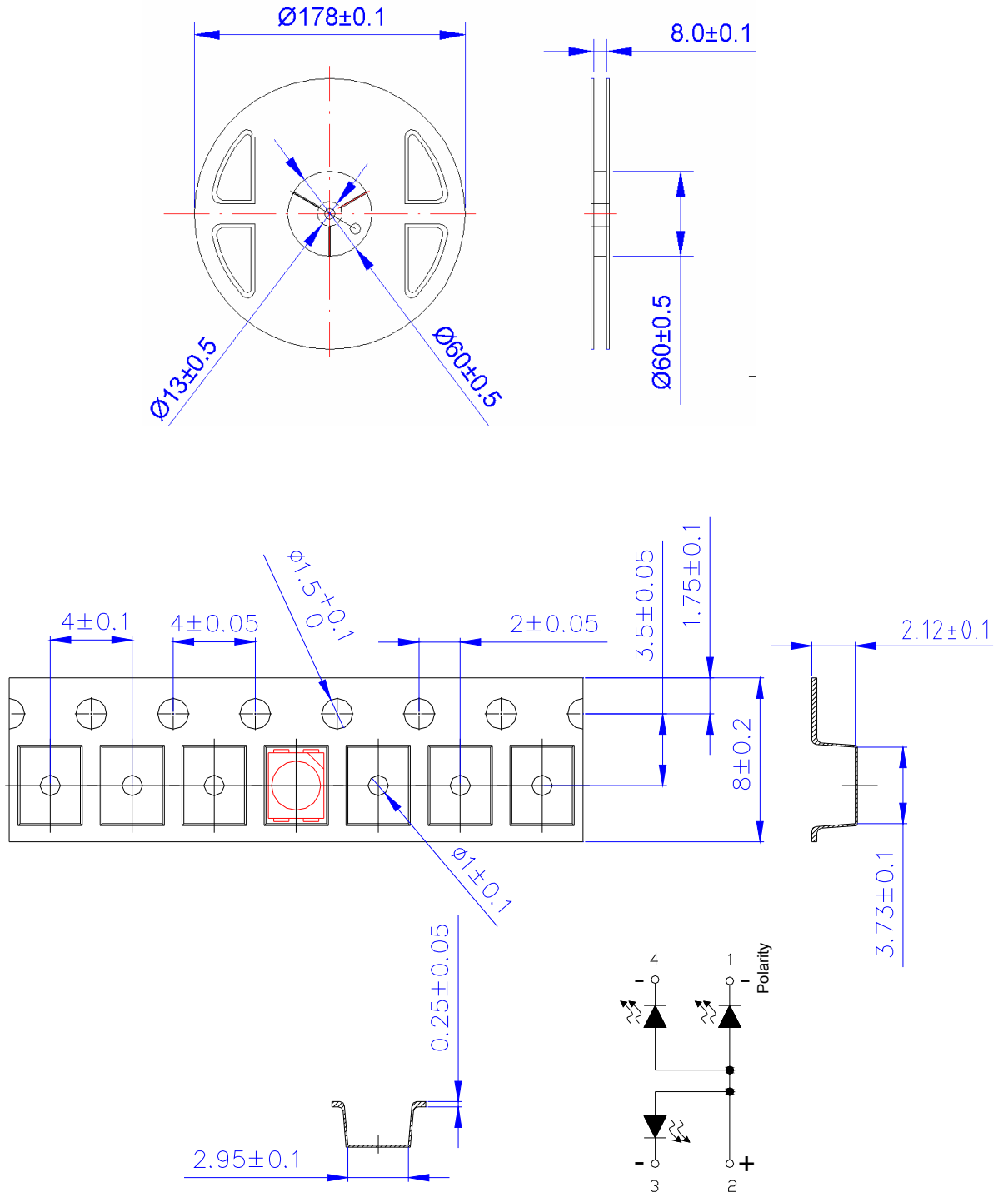
- Reflow soldering should not be done more than twice.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.
- Repair should not be done after the LEDs have been soldered. When repair is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will be damaged by repairing or not.
- The encapsulated material of the LEDs is silicone. Therefore precautions should be taken to avoid the strong pressure on the encapsulated part.

### 2. Cleaning

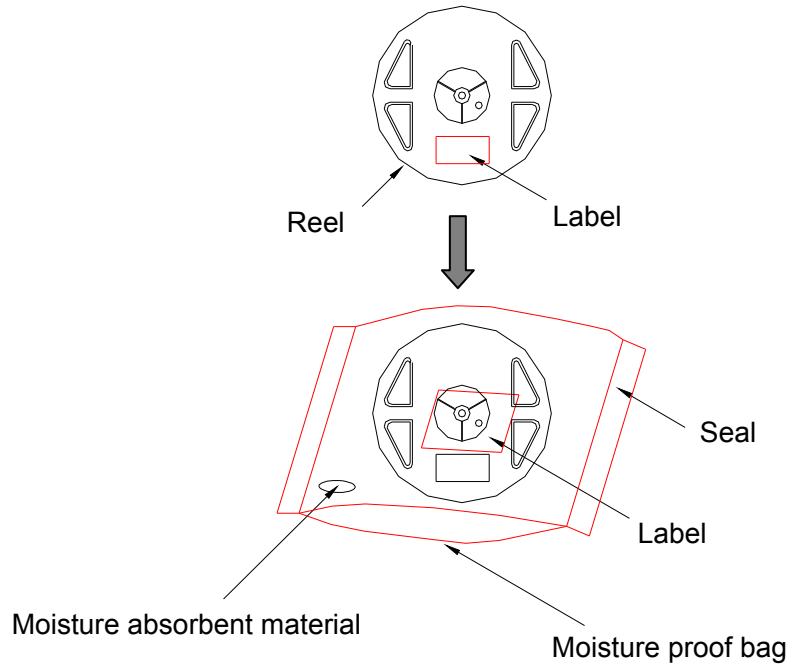
- It is recommended to use isopropyl alcohol as a solvent to clean the LEDs. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not.





## Taping Reel Packing

Unit : mm



## Package



 艾笛森光電股份有限公司		EDISON OPTO CORPORATION	
Part No :	XX	Inspected By:	
Group :	XX		
Color :	XX		
LOT NO.:	XX		
Quantity :	XX		
			
TEL:886-2-82276996 FAX:886-2-82276997			
4F,No.800,Chung-Cheng Rd.,Chung-Ho City,Taipei,Taiwan.			

### Package Label

Item	Quantity	Total	Dimensions(mm)
Reel	2000pcs	2000pcs	Diameter=178
Inner box	5 reels	10,000pcs	240*235*67mm
Outer box	5 inner boxes	50,000pcs	353*254*256mm

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## Precaution for use

### 1. Storage

#### 1.1 Before opening the package:

- The LEDs should be kept at  $<40^{\circ}\text{C}$  &  $<90\%RH$ . The LEDs should be used within a year. When storing the LEDs, moisture proof package with absorbent material (silica gel) is recommended.

#### 1.2 After unpacking

- The LEDs should be kept at  $\leq 30^{\circ}\text{C}$  &  $\leq 60\%RH$ . The LEDs should be soldered within 168 hours (7days) after opening the moisture proof package.
- If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with moisture proof package within absorbent material (silica gel). It is also recommended to return the unused LEDs to the original moisture proof package and to seal the moisture proof package again.
- If the moisture absorbent material (silica gel) vapors or expires the expiration date, baking treatment should be performed by using the following conditions.  
  
baking treatment :  $60^{\circ}\text{C}$  for 20 hours.
- The LEDs electrode and leadframe comprise a silver plated copper alloy. The silver surface may be affected by environments. Please avoid conditions which may cause the LEDs being corroded or discolored. The corrosion or discoloration might lower solderability or affect optical characteristics.
- Please avoid rapid transition in ambient temperature, especially in high humidity environments where condensation can occur.

### 2. Static electricity

- The products are sensitive to static electricity and highly taken care when handling them.
- Static electricity or surge voltage will damage the LEDs. It is recommended to wear an anti-electrostatic wristband or an anti-electrostatic gloves when handling the LEDs.
- All devices, equipments and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.

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## Note

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## Revision History

Version	Subjects (major modified since last revision)	Date
1.0	New Format	2007/07/29