

# SPECIFICATION

**Product : White SMD LED (1608, 0.4t)**

**Part No. : IWS-164-BXWF**

**Date : 2009. 04. 27 Ver. 3.0**

Proposed By	Checked By	Checked By	Checked By	Approval

**Comment**



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# Topview White LEDs

## IWS-164-BXWF



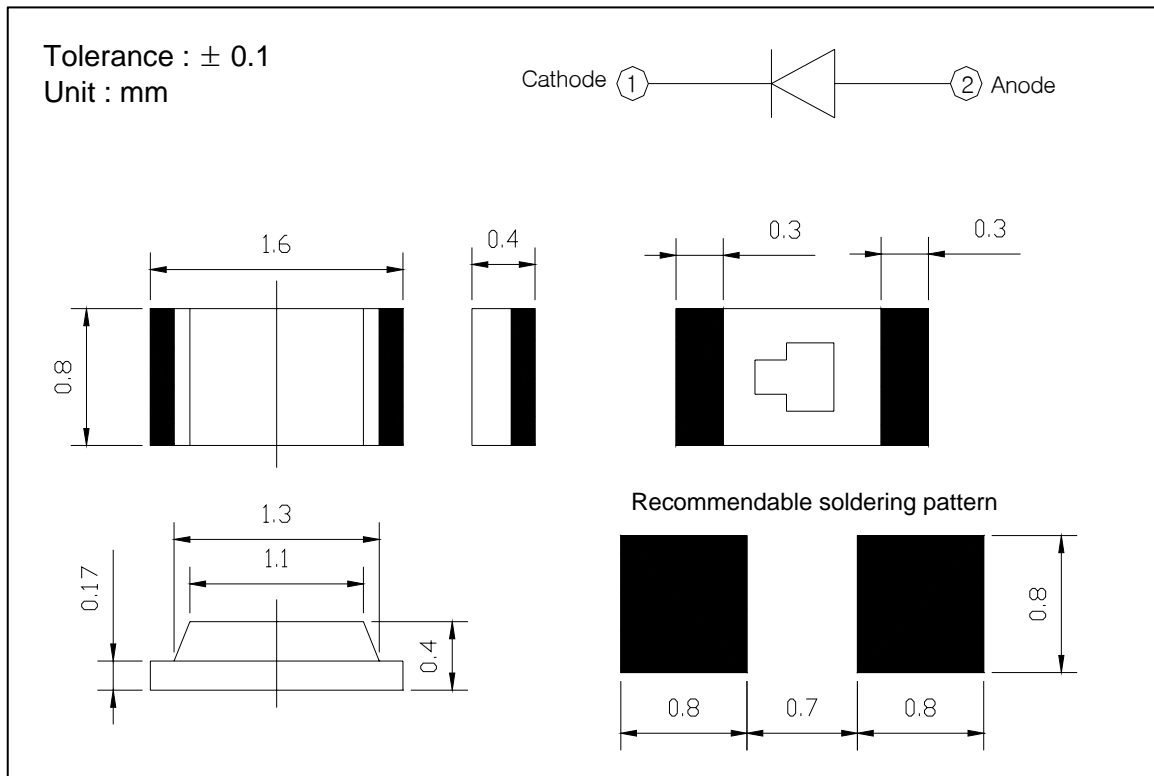
### 1. Features

- High Luminous Intensity : Long operation life
- Low Current Application : Low power consumption
- Excellent Uniformity on Color, Intensity and Forward Current
- 100% Probing Test

### 2. Applications

- Telecommunication : Indicator and backlighting in telephone
- Flat Key Pad backlight for Mobile, switch and symbol
- Indoor sign boards
- General Use

### 3. Outline Drawing and Dimension



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### 4. Absolute Maximum Ratings

Items	Symbols	Ratings	Unit
Operation Forward Current	$I_F$	5	mA
Peak Pulsed Forward Current* <sup>1</sup>	$I_{PF}$	30	mA
Operating Temperature Range	$T_{OP}$	-30 ~ +85	°C
Power Dissipation	$T_D$	16	mW
Reverse Current	$I_R$	10	uA
Storage Temperature Range	$T_S$	-40 ~ +100	°C
Soldering Temperature	$T_{SOL}$	260 ± 5	°C

\*1 Duty ratio = 1/10, Pulse width = 0.1ms

### 5. Electrical & Optical Characteristics (Ta : 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit.
Forward Voltage	$V_F$	$I_F = 5 \text{ mA}$	2.7	2.9	3.1	V
Reverse Current	$I_R$	$V_R = 5 \text{ V}$	-	-	10	uA
Luminous Intensity* <sup>2</sup>	$I_V$	$I_F = 5 \text{ mA}$	15	-	35	mcd
Dominant Wavelength* <sup>3</sup>	$W_D$	$I_F = 5 \text{ mA}$	460	-	475	nm
View Angle* <sup>4</sup>	$2\Theta_{1/2}$	$I_F = 5 \text{ mA}$	-	130	-	Degrees

• 2 Luminous Intensity is tested by a tester calibrated by CAS 140B(CIE LED\_B) and has an accuracy of 10%

• 3 Dominant wavelength has an accuracy of ±1nm.

• 4 Viewing angle is the angle until 50% of brightness measured from the front part of LED.

#### 5.1 Luminous Intensity Rank

Rank	Luminous Intensity (mcd)
G	15 - 20
H	20 - 25
I	25 - 30
J	30 - 35

#### 5.3 Forward Voltage Rank

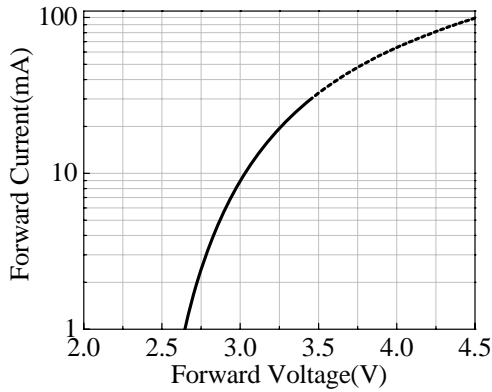
Rank	Forward Voltage (V)
a	2.7 - 2.8
b	2.8 - 2.9
c	2.9 - 3.0
d	3.0 - 3.1

#### 5.2 Dominant Wavelength Rank

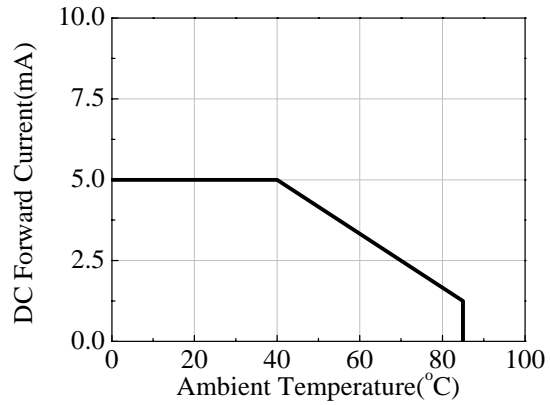
Rank	Dominant wavelength (nm)
A	460 - 465
B	465 - 470
C	470 - 475

### 6. Typical Characteristic Curve

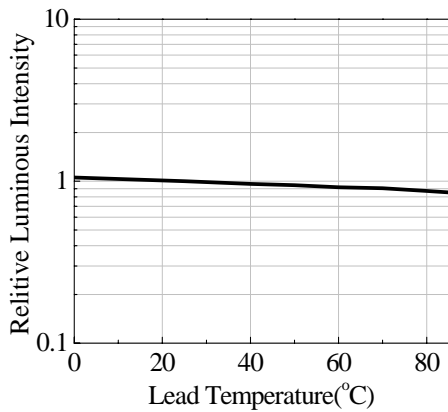
**Forward Current vs. Forward Voltage**



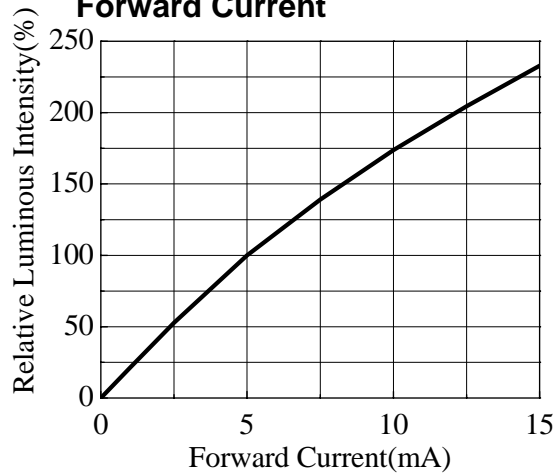
**Forward Current vs. Ambient Temperature**



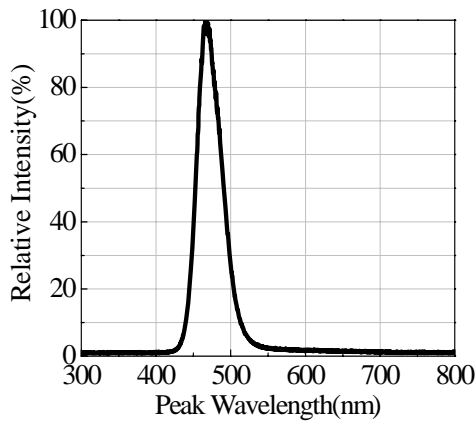
**Relative Luminous Intensity vs. Ambient Temperature**



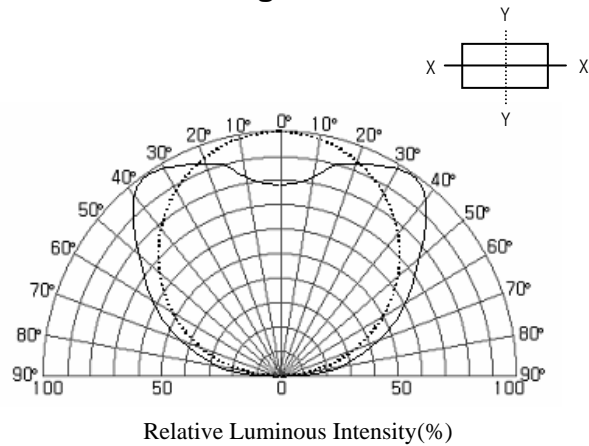
**Luminous Intensity vs. Forward Current**



**Relative Luminous Intensity vs. Wavelength**



**Radiation Diagram**

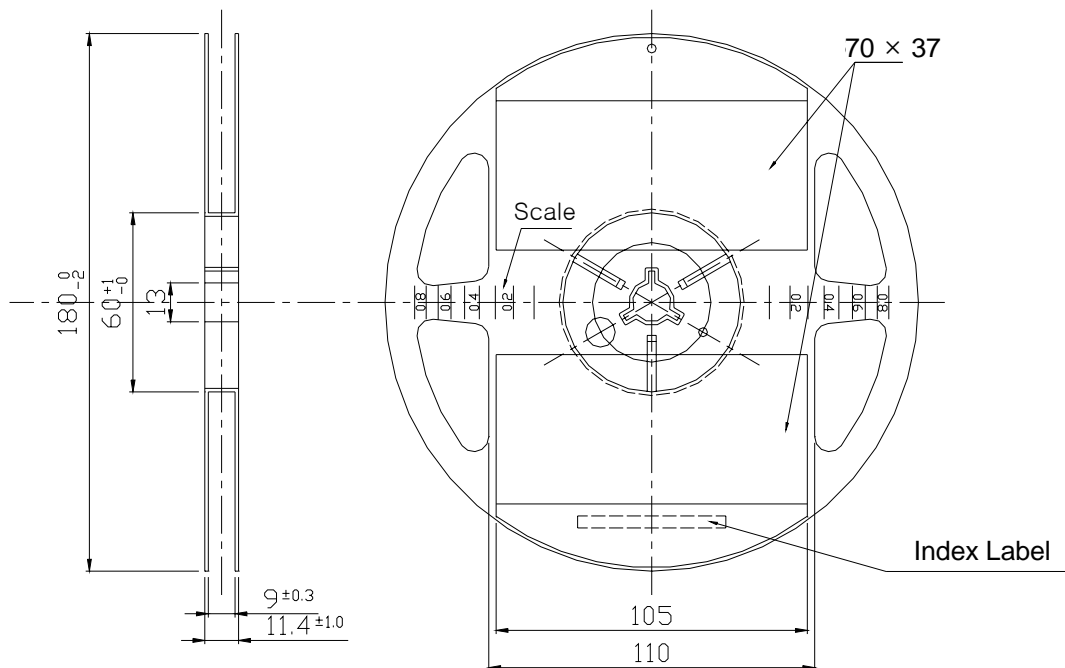
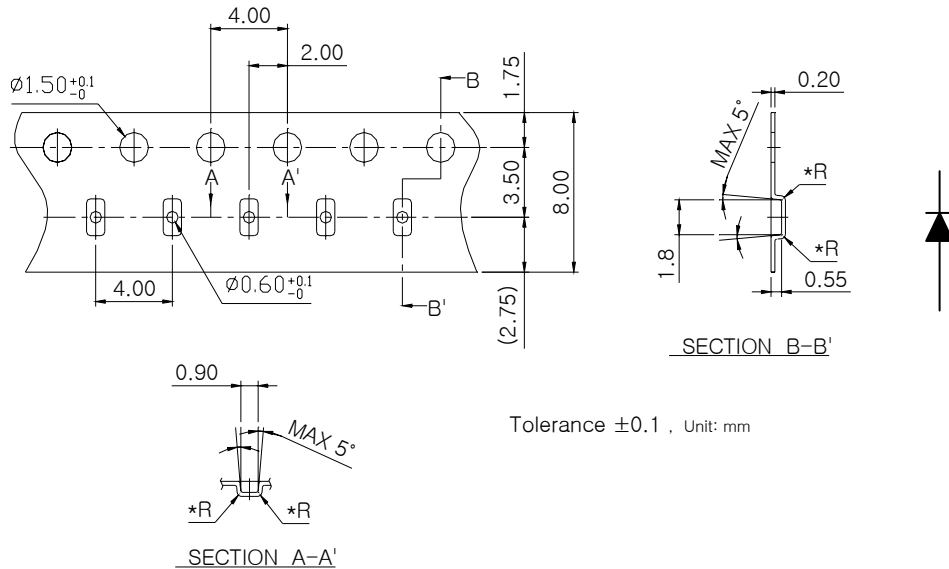


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### 7. Dimension of Tape / Reel



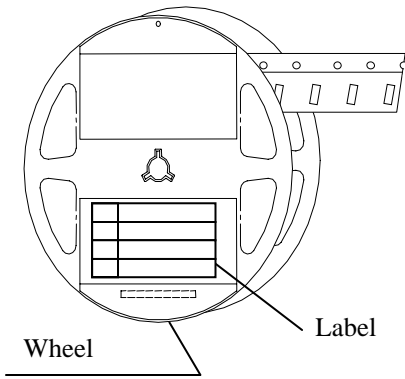
- (1) Quantity : Product are packed in one taping reel of max. 4,000 pcs.
- (2) Cumulative tolerance : Cumulative tolerance/10 pitches to be  $\pm 0.2$ mm
- (3) Adhesion strength of cover tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at 10°C angle to be the carrier tape.
- (4) Packaging : P/N, manufacturing data code no. and quantity to be indicated on a damp proof package.

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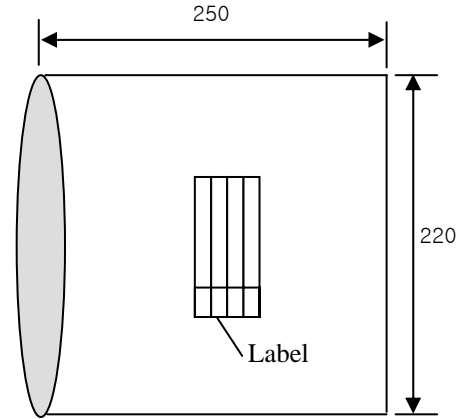


### 8. Packing Dimension



Diameter : 180 mm  
 Width : 12 mm  
 1608 ⇒ 4,000 pcs/Reel

Bake: 60°C, 4hrs

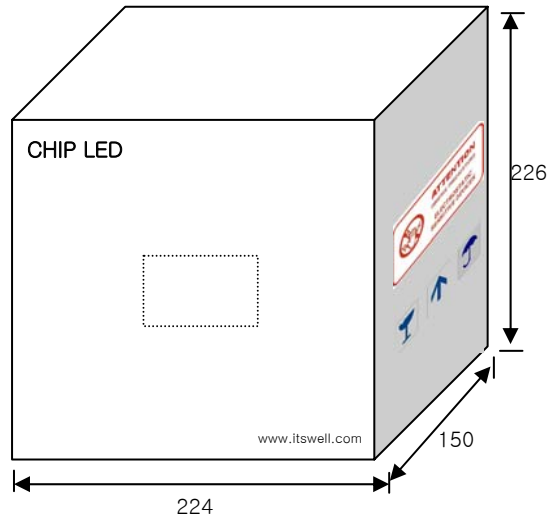


Shield Bag(Polyester/Al/LDPE)  
 1 Reel/Bag ( T = 0.1 mm ) with Silica gel



#### Al Pack Label, Reel Label (70 × 37)

<b>ITSWELL</b>				
Lot :		IWS-164-BXWF		
	MIN	AVG	MAX	STD
VF[volt]				
IV[mcd]				
WD[nm]				
Q'ty :		yyyy/mm/dd		

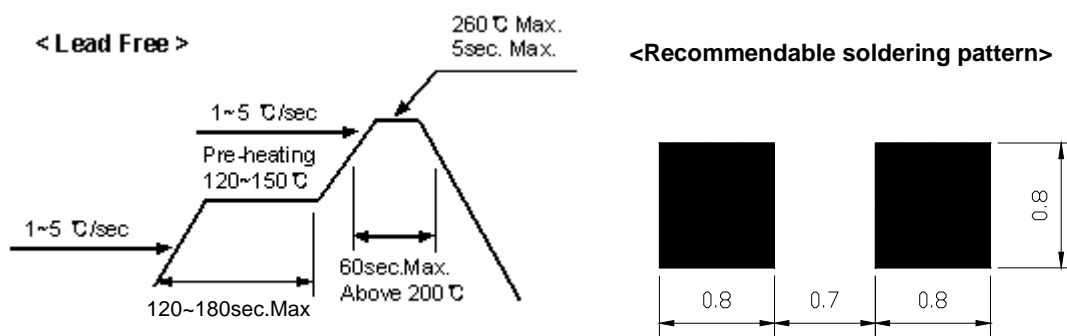


Maximum 10 Bags / 1 Inner Box  
 1608 ⇒ 40,000 pcs / 1 Inner Box

### 9. Precaution in use

#### 9.1 Soldering Conditions

- When soldering SMD LED , Heat may affect the electrical and optical characteristics of the LEDs.
- In soldering, do not stress the lead frame and the resin part under the high temperature.
- The epoxy part should be protected from mechanical stress or vibration until the SMD LEDs return to room temperature after soldering.
- Preliminary heating to be at 150 °C max. for 180 Seconds max.
- Soldering heat to be at 260 °C max. for 5 sec. Max.
- For manual soldering is not more than 3 sec at max 350 °C , under soldering iron



#### 9.2 Storage

- Use with 7days after opening packing. Store in 10 to 30 °C SMD LED lead frames are plated silver. The silver surface may be affected by environment which contain corrosive gases and so on. Please avoid condition which may cause the SMD LED to corroded, tarnish or discolor.

#### 9.3 Static Electricity

- Static electricity or surge voltage damages the SMD LEDs. It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
- A tip soldering iron is requested to be grounded. An ionizer should also be installed where risk of static.
- All devices, equipment and machinery must be properly grounded (via 1M $\Omega$ ). It is recommended that measures be taken against surge voltage to the equipment that mounts the SMD LEDs.

#### 9.4 Cleaning

- Isopropyl Alcohol or Ethylene Alcohol is recommended in 5 minutes at room temperature. Don't use unspecified chemical may cause crack or haze on the surface of the epoxy resin.
- Before cleaning, a pre-test should be done to confirm whether any damage to the SMD LED will occur.
- Freon solvents should not be used to clean the LEDs because of worldwide regulations.

#### 9.5 Humidity

- Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.

### 10. Reliability

#### 10.1 Reliability Test Item

Test Items	Test Conditions	Notes
High Temperature Storage	100 °C , 1000 hr.	0/25
Low Temperature Storage	-40 °C , 1000 hr.	0/25
Temp. Humidity Storage	60 °C , 90 % RH, 1000 hr.	0/25
Steady State Operating Life	25 °C , 5 mA , 1000 hr.	0/25
High Temperature Operating Life	85 °C , 1.25 mA, 1000 hr.	0/25
Low Temperature Operating Life	-30 °C , 5 mA, 1000 hr.	0/25
Steady State Operating Life Of High Humidity Heat	60 °C , 90 % RH, 3.5 mA, 1000 hr.	0/25
Thermal Shock	-40°C(30min)→100°C(30min.), 100 cycle	0/20
ESD	HBM, 100pF, 1.5kohm, 3 times	0/20

#### 10.2 Criteria for Judging the Damage

Items	Test Conditions	Criteria for judgment
Luminous Intensity ( $I_V$ )	$I_F = 5 \text{ mA}$	More than > 50% of S
Forward Voltage ( $V_F$ )	$I_F = 5 \text{ mA}$	Less than 120% of U
Reverse Current ( $I_R$ )	$V_R = 5 \text{ V}$	Less than $10 \mu\text{A}$

\* U means the upper limit of specified characteristics, S means initial value.

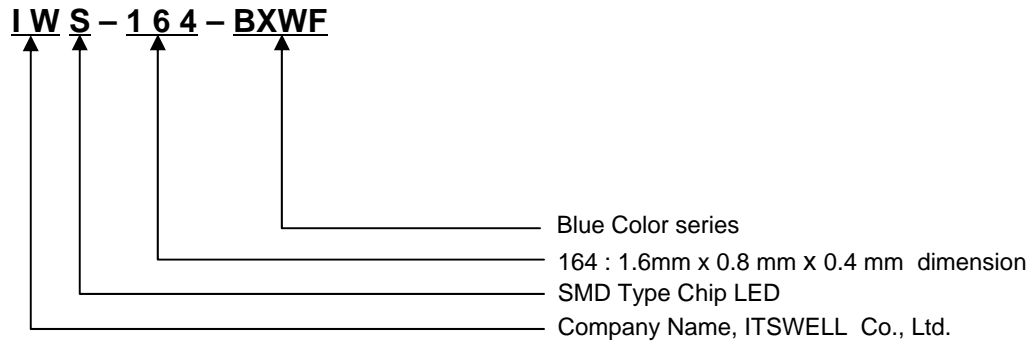


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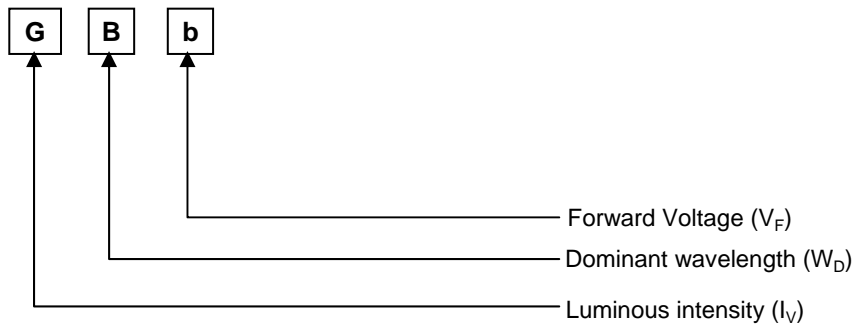
## IWS-164-BXWF



### 11. Part Name Description



### 12. Rank Description



### 13. ATTENTION : Electric Static Discharge (ESD) Protection



The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still necessary even though they are safe in low static-electric discharge. Material in AlInGaP, GaP, or/and InGaN based chips are STATIC SENSITIVE devices. ESD protection has to be considered and taken in the initial design stage. If manual work/process is needed, please ensure the device is well protected from ESD during all the process. LED's ESD Level is 'Class 1' and the range of forward voltage is 1V ~ 1999V.

After opening the package, the LED's should be kept at 30 °C, 70%RH or less. The LEDs must be dip soldered within seven days(168 hours) after opening the moisture-proof packing. It is better not to use different rank LEDs. If use mixed rank, could not attain your object for highest quality of products.

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**Spec. Review History**

Review Ver.	Date	Correction List	Etc.
Ver 1.0	2006. 1.25	Establish	
Ver 2.0	2008.04.24	Changed Rank Description	
Ver 3.0	2009.04.27	Changed Absolute Maximum Ratings	