SPECIFICATION

CUSTOMER : _____

DEVICE NAME : _____

MODEL NO. : _____

ISSUED DATE : _____

[CUSTOMER APPROVAL]

APPROVAL NO.				
APPROVAL DATE				
APPROVAL	INSPECTER	CHECK	APPROVAL	COMMENT

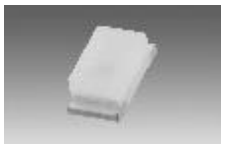
[SUPPLIER]

ISSUED DEPT.	ISSUE	REVIEW	REVIEW	APPR'D

- CONTENTS -

1. FEATURES

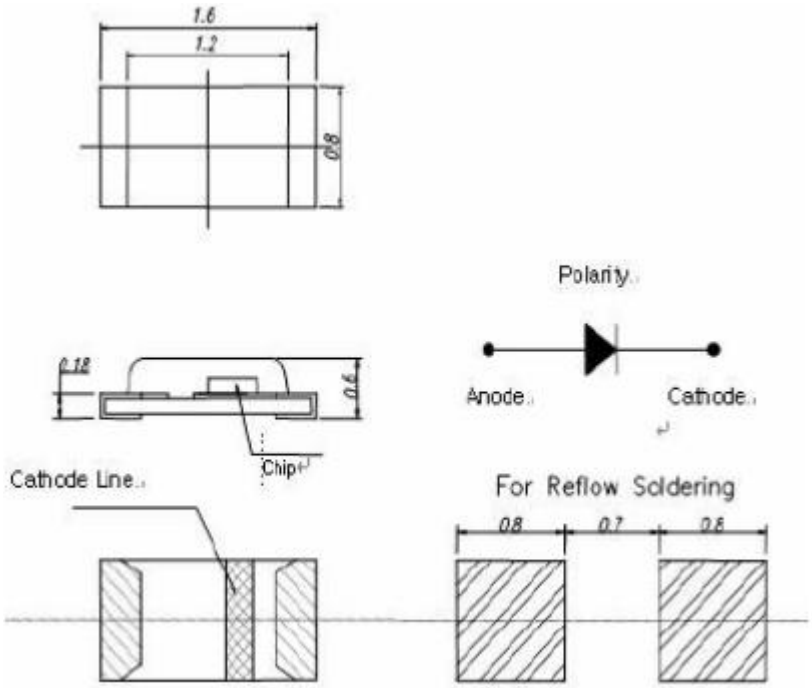
- SMD Top View type
- 870nm Infrared Emitting
- High Radiant Intensity
- Viewing angle : Lambertian emitter(120˚)
- Package size : 1.6 × 0.8 × 0.4
- Reliability test completion
- Suitable for all SMT



YL-1608F-870nM(A)

2. OUTLINE DIMENSIONS

Unspecified Tolerance : ± 0.1mm



(Unit : mm)

3. SPECIFICATIONS

▣ Absolute Maximum Rating

(Ta=25℃)

Parameter	Symbol	Value	Unit
Power Dissipation	P_D	120	㎽
Peak Forward Current ▶1	I_{FP}	0.5	A
Reverse Voltage	V_R	5	V
Forward Current	I_F	80	㎃
Operating Temperature	Topr	-35 to + 85	℃
Storage Temperature	Tstg	-40 to + 85	℃
Soldering temperature	Tsol	Reflow soldering : 240℃, 10 sec Hand Soldering : 300℃, 3 sec	

▶ 1 : Duty Ratio ≤ 1/100, Pulse Width ≤ 0.01 msec.

▣ Electro-Optical Characteristics

(Ta=25℃)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	V_F	I_F=20 ㎃	-	1.4		V
Reverse Current	I_R	V_R=5V	-	-	10	㎂
Radiant Intensity	Po	I_F=20 ㎃	-	5	-	mW
Viewing Angle ▶3	$2\Theta_{1/2}$	I_F=20 ㎃	-	±60	-	deg.
Peak Wavelength	λ_P	I_F=20 ㎃	-	870	-	nm

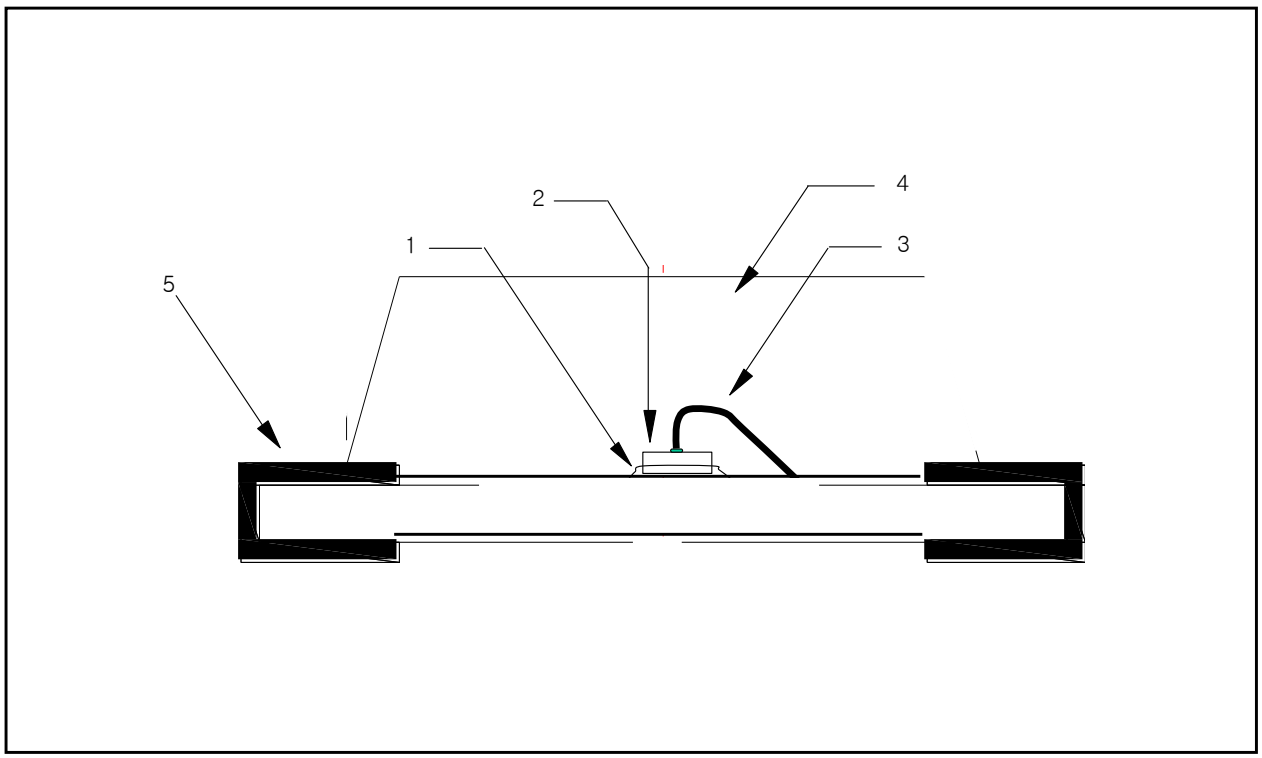
▶ 3 : $\Theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the peak intensity.

※ Measurement Uncertainty : ± 10%

4. COMPOSITION OF DEVICE

A. MATERIALS OF PACKAGE

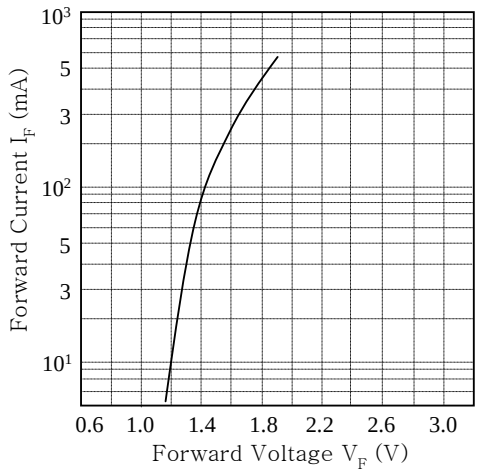
Number	Item	Material
1	Die adhesive	Ag Epoxy
2	LED Chip	AlGaAs
3	Au Wire	1.0mil
4	Mold epoxy	Epoxy Resin
5	Electrodes	Au Plating Cu Alloy



5. ELECTRO-OPTICAL CHARACTERISTICS CURVES

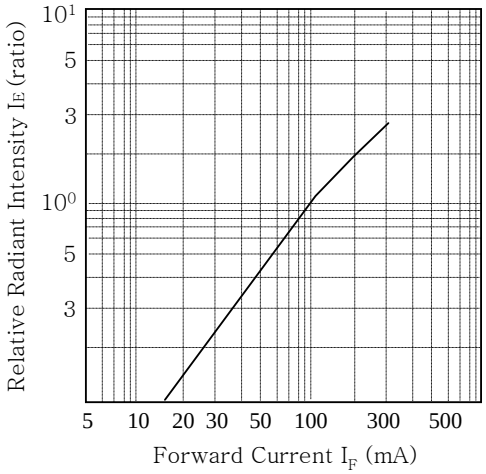
■ **Forward Voltage Vs. Forward Current**

Function : $I_F = f(V_F)$; T_A **= 25℃**



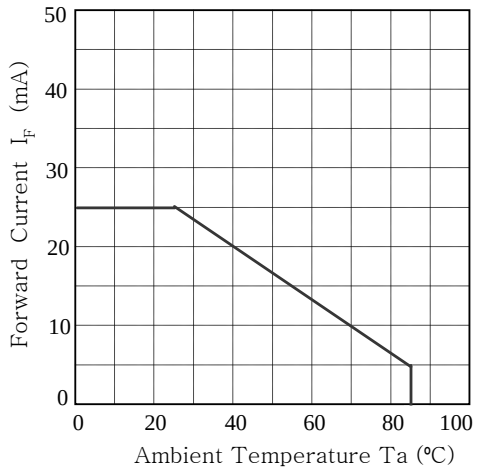
■ **Forward Current Vs. Relative Luminosity**

Function : $I_E/I_{E\,(100mA)} = f(I_F)$; T_A **= 25℃**



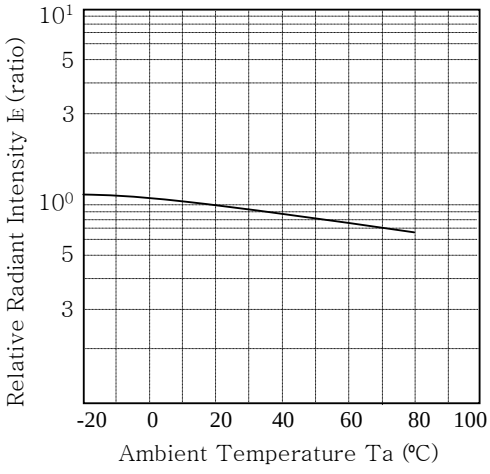
■ **Forward Current Derating Curve**

Function : $I_F = f(T_A)$; $I_F = I_F$ **max**



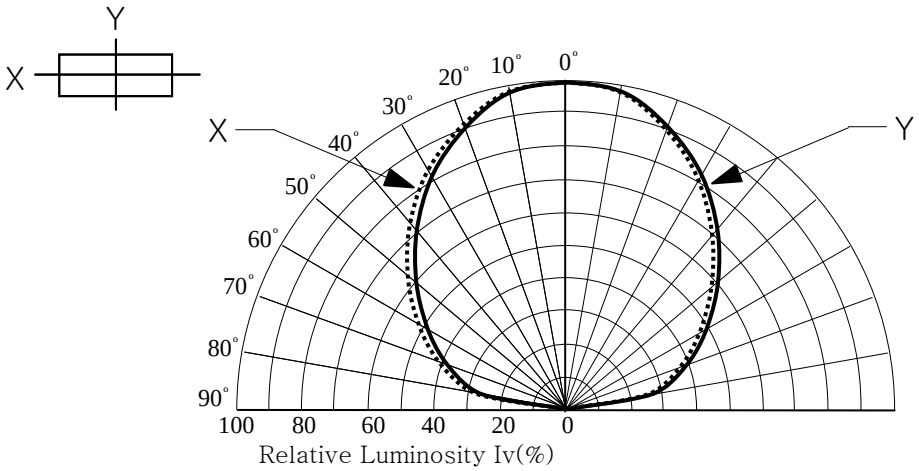
■ **Relative Luminosity Vs. Ambient Ta(℃)**

Function : $I_E/I_{E\,(25℃)} = f(T_A)$; I_F **= 100mA**

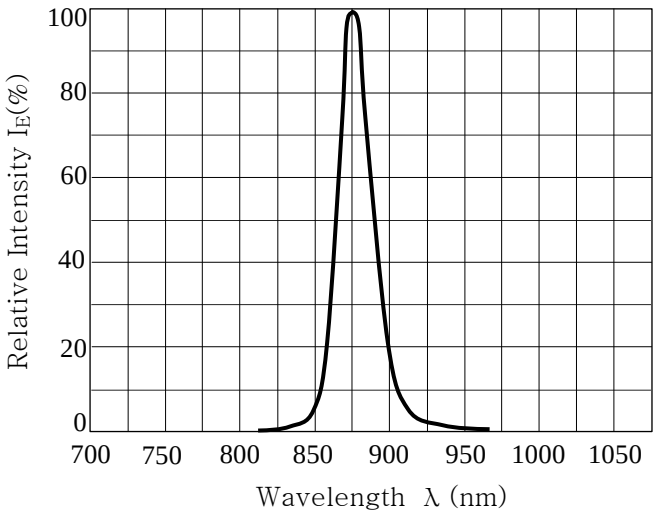


5. ELECTRO-OPTICAL CHARACTERISTICS CURVES

■ **Radiation Characteristics**



■ **Relative Radiant intensity vs. Wavelength**



6. RELIABILITY

A. TEST ITEMS AND RESULTS

Test Item	Standard test method	Test Conditions	Note	Number of Damaged
Resistance to Soldering Heat (Reflow Soldering)	JEITA ED-4701 300 301	Tsol=240℃, 10sec. (Pre treatment 30℃, 70%, 168hrs.)	2 times	0/50
Solderability (Reflow Soldering)	JEITA ED-4701 100 105	Tsol=215±5℃, 3sec.	1 time over 95%	0/50
Heat Shock	JEITA ED-4701 100 105	0℃ ~ 100℃ 5sec. 15sec.	20 cycles	0/50
Temperature Cycle	JEITA ED-4701 100 105	-40℃ ~ 25℃ ~ 100℃ ~ 25℃ 15min. 5min. 15min. 5min.	100 cycles	0/50
High Humidity Heat Cycle	JEITA ED-4701 200 203	30℃ ~ 65℃ ~ -10℃ 90%RH 24hrs./1cycle	10 cycles	0/50
High Temperature Storage	JEITA ED-4701 200 203	Ta=100℃	1000 hrs.	0/50
Humidity Heat Load	JEITA ED-4701 100 103	Ta=60℃, RH=90%	1000 hrs.	0/50
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40℃	1000 hrs.	0/50
Life Test Condition 1		Ta=25℃, IF=20mA	1000 hrs.	0/50
High Temperature Life Test		Ta=85℃, IF=5mA	1000 hrs.	0/50
High Humidity Heat Life Test		60℃, RH=90%, IF=15mA	500 hrs.	0/50
Low Temperature Life Test		Ta=-30℃, IF=20mA	1000 hrs.	0/50

B. CRITERIA FOR JUDGING THE DAMAGE

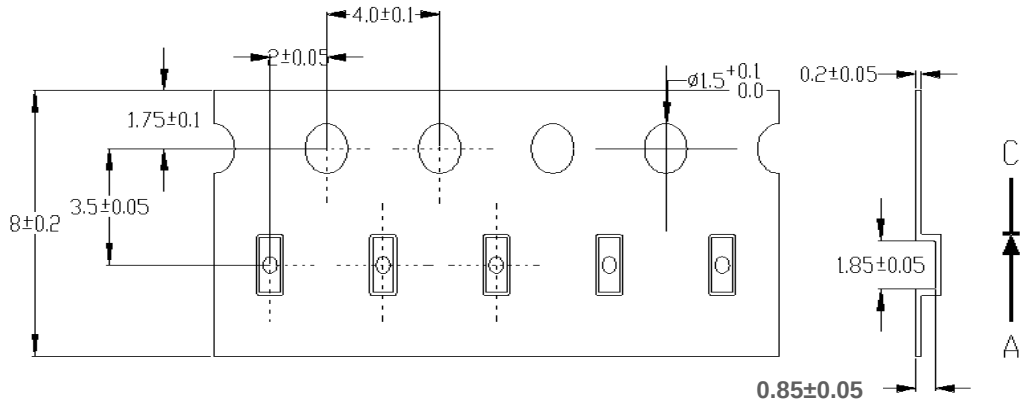
Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=20mA	-	U.S.L.*) × 1.1
Reverse Current	IR	VR=5V	-	U.S.L.*) × 2.0
Luminous Intensity	IV	IF=20mA	L.S.L.**) × 0.7	-

*) U.S.L. : Upper Standard Level **) L.S.L. : Lower Standard Level

7. TAPING

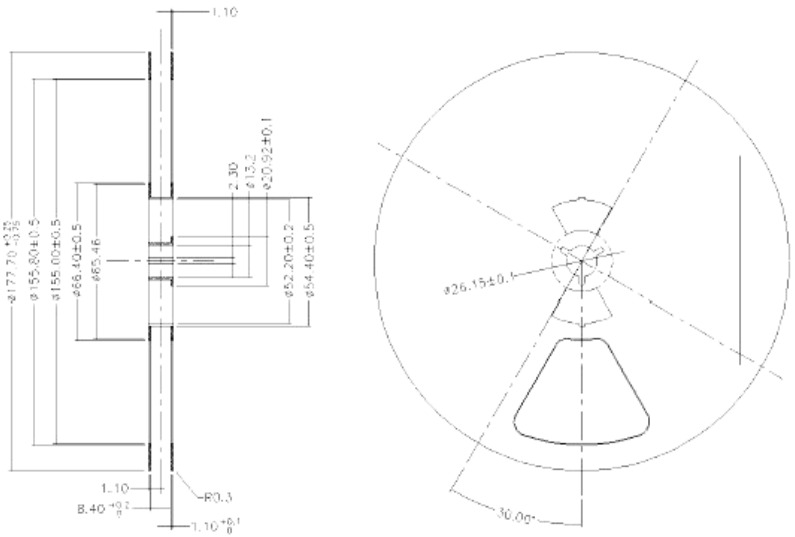
A. Dimension of Tape (Material : PS Carbon, 10E5Ω)

(Unit : mm)



B. Dimension of Wheel (Material : PS Conductive, 10E9~12Ω)

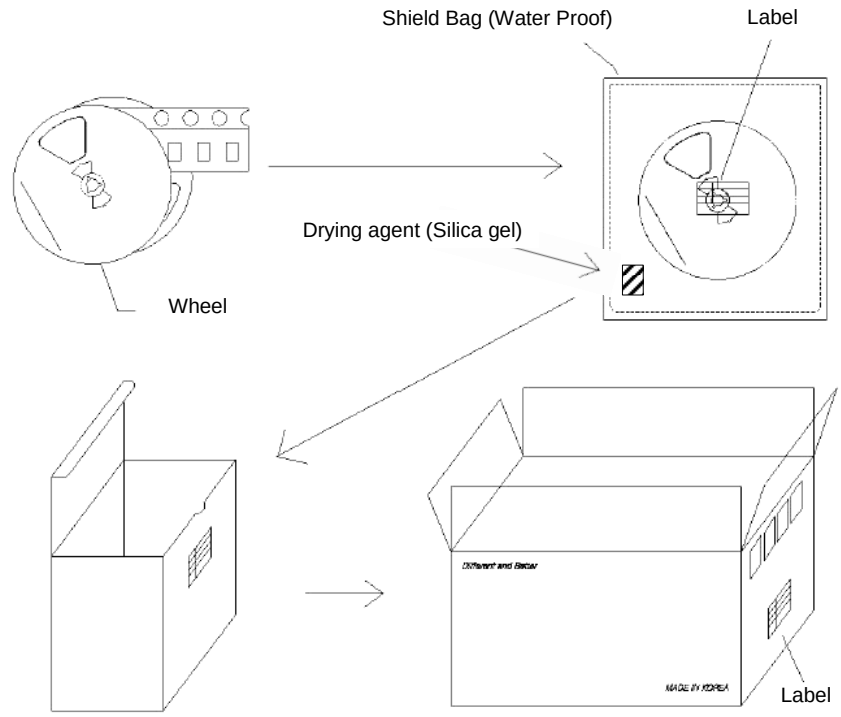
(Unit : mm)



Loading quantity per reel : 4,000pcs

8. PACKING

A. Packing diagram



B. Precaution

A. The label on the minimum packing unit shows : Part Number, Lot Number, Ranking, Quantity
In order to protect the LEDs from mechanical shock, we pack them in cardboard boxes for transportation.

B. The LEDs may be damaged if the boxes are dropped or receive a strong impact against them, so precautions must be taken to prevent any damage.

C. The boxes are not water resistant and therefore must be kept away from water and moisture.
When the LEDs are transported, we recommend that you use the same packing method as YesLED

9. CUATIONS

(1) Moisture Proof Package

- **When moisture is absorbed into the LEDs it may vaporize and expand during soldering. There is a possibility that this can cause the exfoliation of the contacts and the damage the optical characteristics of the LEDs. For this reason, the moisture proof package is used to keep moisture to a minimum in the package.**
- **After opening the package, the LEDs should be kept at 30℃, 40~70%RH.**
  The LEDs should be soldered within 168 hours(7days) after opening the package.
- **When storing the LEDs after opening the package, use a sealable away from package with a moisture absorbent material(Silica gel) inside.**
- **If the blue color of the desiccant indicator has faded after storing, a baking treatment should be performed as follows : 65 ± 5℃ for more than 24 hours.**

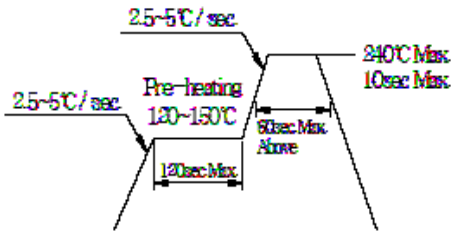
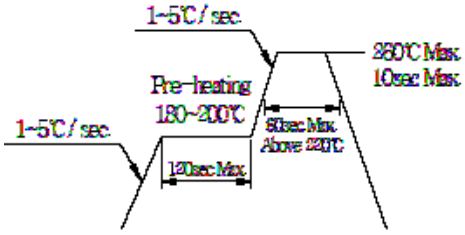
(2) Soldering Conditions

- **The LEDs can be soldered in place using the reflow soldering method.**
- **The recommended soldering conditions are as follows:**
-

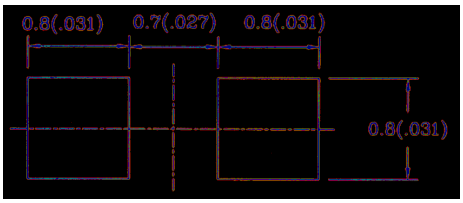
Reflow Soldering			Hand Soldering	
	Lead Solder	Lead-free Solder		
Pre-heat	120~150℃	180~200℃	Temperature	350℃ Max
Pre-heat time	120sec Max	120sec Max	Soldering time	3sec Max
Peak temperature	240℃ Max	260℃ Max		(one time only)
Soldering time	10sec Max	10sec Max		
Condition	refer to Temperature profile ①	refer to Temperature profile ②		

* After reflow soldering rapid cooling should be avoided.

- **Temperature-Profile**

A. Lead Solder	B. Lead-free Solder
	

- **Recommended Soldering**



(Unit : mm)

- **Modifications should not be done after the LEDs have been soldered.**
  If modifications cannot be avoided, a double-head soldering iron should be used after checking whether the characteristics of the LEDs will not be damaged by modification after soldering.
- **Reflow soldering, do not apply force to the package during heating.**
- **After soldering, do not warp the circuit board.**

(3) Heat Generation

- **Heat generation must be taken into design consideration when using the LEDs.**
  The coefficient of temperature increase per input electric power is about 0.62℃/mW at the LED's active layer. This coefficient will be affected by the heat resistance of the circuit board and by dense mounting of the LEDs. At the same time, precautions must be taken into the design of circuitry to avoid intense heat generation. Proper designs which allow radiation of heat, etc. may be needed.

(4) Static Electricity

- **Static Electricity and surge damages the LEDs. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.**
- **All devices, equipment and machinery must be properly grounded.**
- **When inspecting own final products on which LEDs were mounted, it is recommended to check also whether the mounted LEDs are damaged by static electricity or not.**
- **Damaged LEDs will show some unusual characteristics such as leak current remarkably increases, starting forward voltage becomes lower, or the LEDs get unlighted at the low current.**

(5) Cleaning

- **Use Isopropyl Alcohol as a solvent for cleaning the LEDs. Using other solvents may dissolve the LED package and the epoxy. Caution is needed.**
  Ultrasonic cleaning of the LEDs should not be done.

(6) Others

- **The electrode sections are plated with silver. Those will become discolored by contact with corroded gas etc. Precautions must be taken to maintain a clean storing atmosphere.**
- **These LEDs described in this brochure are intended to be used for ordinary electronic equipment. Consult YesLED's sales staff in advance for information on the applications in which exceptional quality and reliability are required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as airplanes, aerospace, automobiles, life support systems and safety devices).**
- **User shall not reverse engineer by disassembling or analysis of the LEDs without having the prior written consent of YesLED. When defective LEDs are found, User shall inform to YesLED directly before disassembling or analysis.**
- **The appearance and specifications of the product may be modified for improvement without notice.**