

# TOL-309URFC-ST17-P9-205

## Lamp LED

Part Number	Chip		Lens Color
	Material	Source Color	
TOL-309URFC-ST17-P9-205	AlGaInP	Red	Water Clear

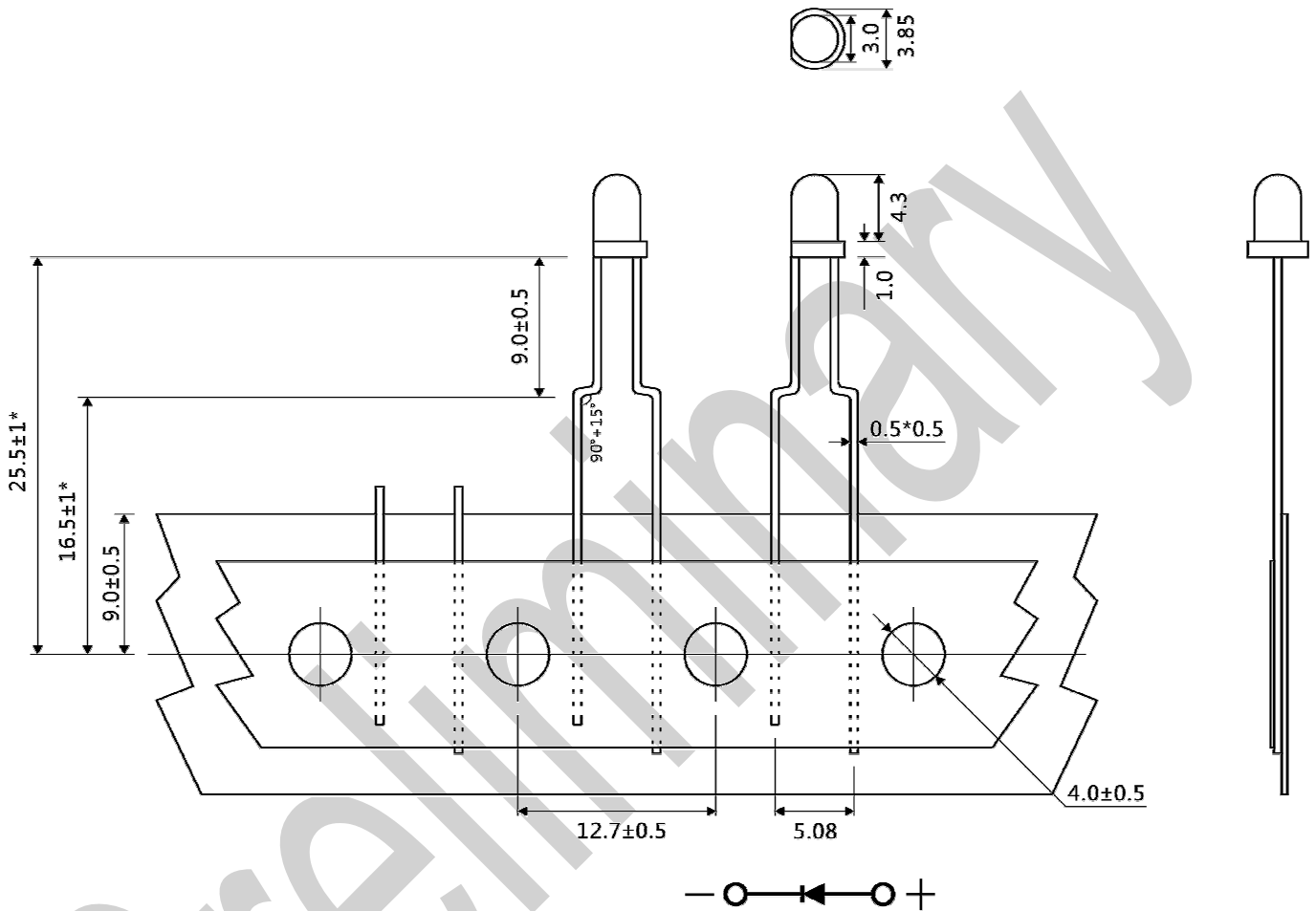
### Features

- Low Power Dissipation
- Good Reliability
- I.C Compatible
- Pb Free
- Complied With ROHS Directive

### Applications

- TV set
- Monitor
- Telephone
- Computer

## Dimensions



### Notes:

1. All dimensions are in millimeter.
2. Tolerance is  $\pm 0.20$ mm unless otherwise noted.
3. The dimensions marked with "\*" are those under strict control. Other dimensions are for reference only.

### Absolute Maximum Rating @ Ta=25°C

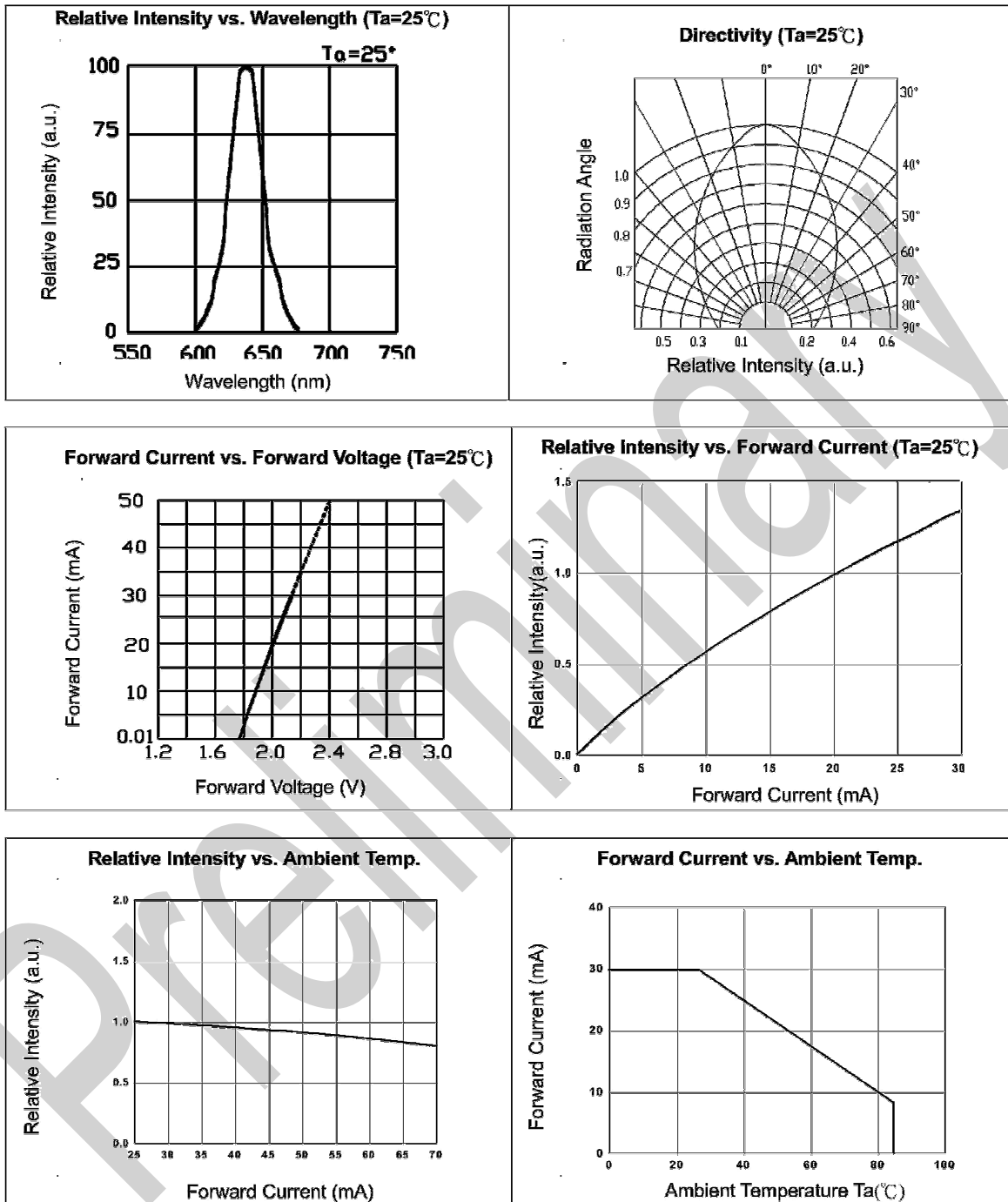
Parameter	Maximum Rating	Unit
Peak Forward Current (1/10 duty and 0.1msec width)	50	mA
Power Dissipation	72	mW
Continuous Forward Current	30	mA
Reverse Voltage	5	V
Operating Temperature Range	-40 to +85	
Storage Temperature Range	-40 to +85	
Wave Soldering Profile For Lead Free Soldering	260°C for 5 Sec	

### Electrical / Optical Characteristic @ Ta=25°C

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Luminous Intensity	$I_v$	129	/	493	mcd	$I_F=20mA$
Viewing Angle	$2\theta_{1/2}$	/	90	/	deg	$I_F=20mA$
Forward Voltage	$V_F$	1.8	/	2.4	V	$I_F=20mA$
Dominant Wavelength	$\lambda_d$	630	/	640	nm	$I_F=20mA$
Spectral Line Half-Width	$\Delta\lambda$	/	29	/	nm	$I_F=20mA$
Reverse Current	$I_R$	/	/	10	$\mu A$	$V_R=5V$

Remark: The tolerance of intensity  $\pm 15\%$ , the tolerance of wavelength  $\pm 1nm$ , the tolerance of forwards voltage  $\pm 0.1V$ . Only reference for above when testing.

## Typical Electrical-Optical Characteristics Curves



## Bin Code List for Reference

Luminous Intensity		Unit: mcd@20mA
Bin Code	Min	Max
B31	129	162
B32	162	202
B33	202	252
B34	252	316
B35	316	394
B36	394	493

Tolerance of Luminous Intensity on each bin is  $\pm 15\%$

Dominant Wavelength		Unit: nm@20mA
Bin Code	Min	Max
106	630	632
107	632	634
108	634	636
109	636	638
110	638	640

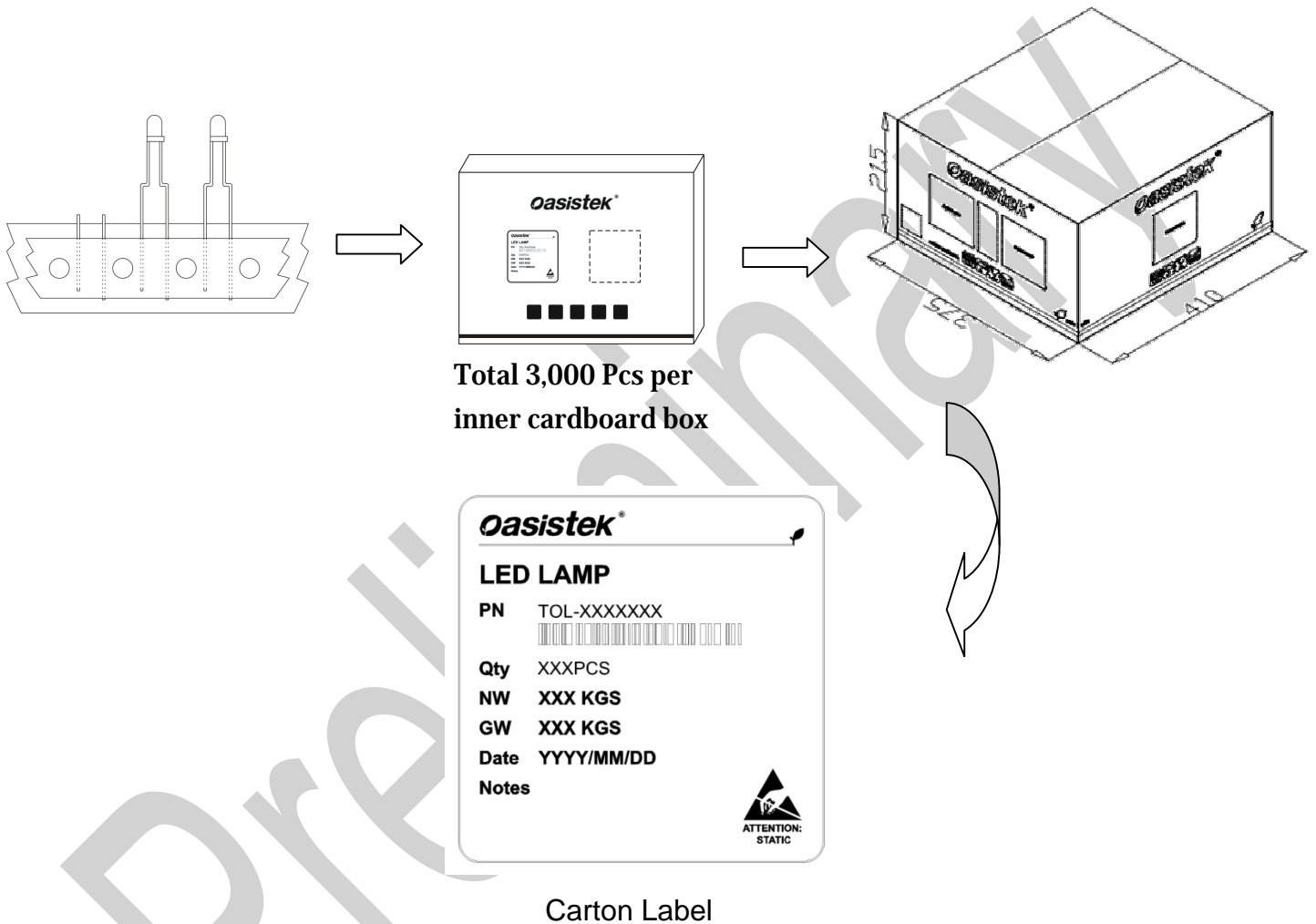
Tolerance of Dominant on each bin is  $\pm 1\text{nm}$

Forward Voltage		Unit: V@20mA
Bin Code	Min	Max
V05	1.8	2.0
V06	2.0	2.2
V07	2.2	2.4

Tolerance of Forward Voltage on each bin is  $\pm 0.1$

## Package Description

The LED's are packed in cardboard boxes after packaging in plastic bags. According to the total delivery amount, cardboard boxes will be used to protect the LED's from mechanical shocks during transportation. The label on the minimum packing unit bag shows. The boxes are not water resistant and therefore must be kept away from water and moisture. The picture and carton size are for reference only.

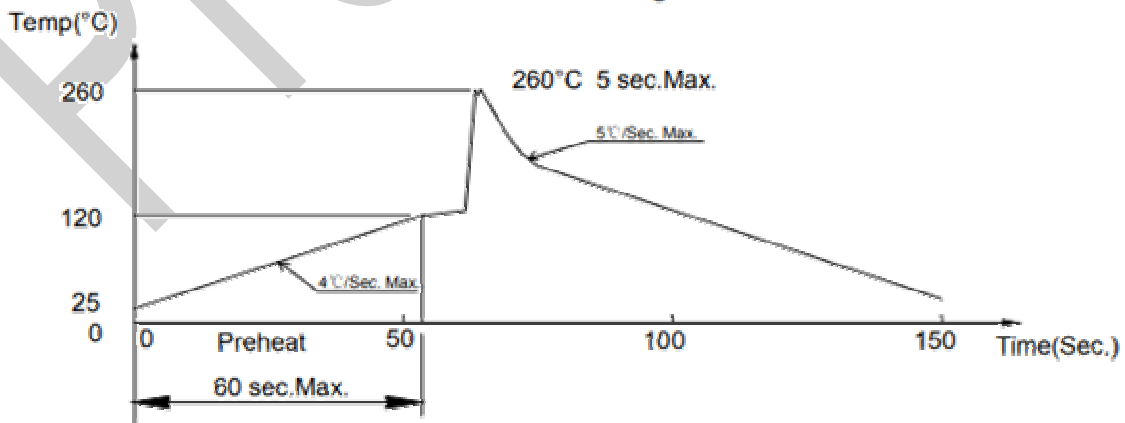


## Reliability Tests

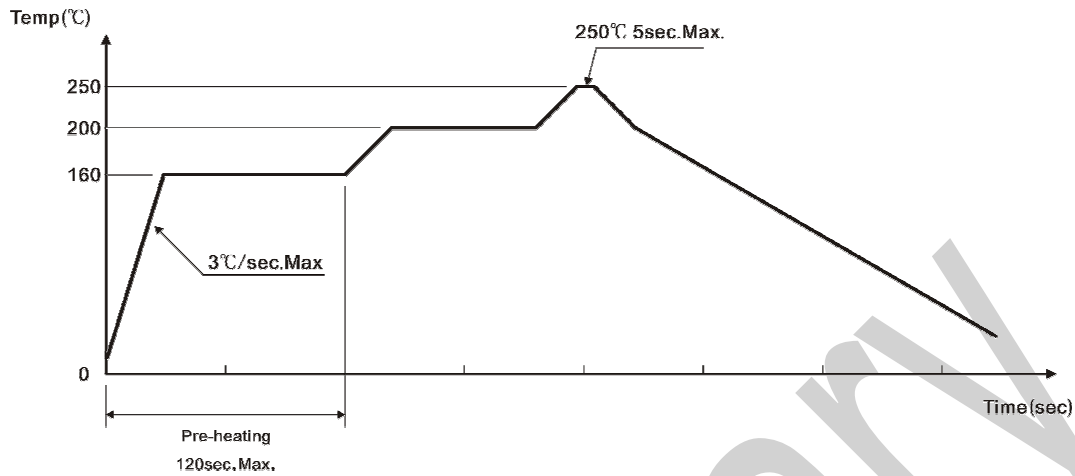
Test Item	Test Condition	Cycle/Time	Criteria	Number of Damaged
Thermal Shock	-40°C*30min~85°C*30min	100 cycles		0/20
Temperature Cycle	-35°C*30min~25°C*10min~85°C*30min~25°C*10min	100 cycles	Failure Define: VF ≥ Initial Datasheet 1.1 (V) @ I <sub>F</sub> =20mA	0/20
High Temperature Storage	T <sub>a</sub> = 85±5°C	1000 hours	IR ≥ 30 μA @ V <sub>R</sub> = 5V	0/20
Low Temperature Storage	T <sub>a</sub> = -40±5°C	1000 hours	I <sub>v</sub> ≤ Initial Datasheet 0.7 (mcd) @ I <sub>F</sub> =20mA	0/20
DC Operating Life	T <sub>a</sub> = 25°C, 20mA	1000 hours		0/20
Reflow Soldering Test	250°C 5sec	3 times	After tested without electrical insufficient	0/20

ring( Pb-free )		Manual Soldering		Reflow Soldering( Pb-free )	
Pre-heat	120°C Max	Temperature	300°C Max	Pre-heat	160°C Max
Per-heat time	60 sec. Max	Soldering time	3 sec Max(one time only)	Per-heat time	120 sec. Max
Solder Bath	260°C Max	Position	No closer than 3mm from the base of the epoxy bulb	Solder Bath	250°C Max
Temperature				Temperature	
Soldering time	5 sec Max			Soldering time	5 sec Max
Position	No closer than 3mm from the base of the epoxy bulb.			Position	

### Wave Soldering



## Reflow Soldering



### Notes:

1. Wave solder should not be made more than one time.
2. You can just only select one of the soldering conditions as above.

## Cautions

The LED's are devices which are materialized by combining chip, glue and so on. Consequently the color of the LED's is changed a little by an operating current. Care should be taken after due consideration when using LED's.

### (1) Moisture Proof Package:

When moisture is absorbed into the DIP package it may make the pins get rust. There is a possibility that this can cause poor welding. For this reason, the moisture proof package is used to keep moisture to a minimum in the package.

### (2) Storage Conditions

#### Before opening the package:

The LED's should be kept at 30°C or less and 60%RH or less. The LED's should be used within a year. When storing the LED's. Moisture proof packaging with absorbent material (silica gel) is recommended.

#### After opening the package:

The LED's should be kept at 30°C or less and 50%RH or less. The LED's should be soldered within 168 hours (7days) after opening the package. If unused LED's remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LED's to the original moisture proof bag and to reseal the moisture proof bag again. If the moisture absorbent material (silica gel) has faded away or the LED's have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: more than 48 hours at 65±5°C Oasistek LED electrode and lead free are comprised of a silver plated copper alloy. The silver surface may be affected by environments which contain corrosive gases and so on. Please Avoid conditions which may cause the LED to

corrode, tarnish or discolor. This corrosion or discoloration might lower solder ability or might affect on optical characteristics. Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

### (3) Heat Generation

Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification. The operating current should be decided after considering the ambient maximum temperature of LED's.

### (4) Cleaning

It is recommended that isopropyl alcohol be used as a solvent for cleaning the LED's. when using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the LED's because of worldwide regulations. Do not clean the LED's by the ultrasonic. When it is absolutely necessary, the influence of ultrasonic cleaning on the LED's depends on factors such as ultrasonic power and the assembled condition. Before cleaning, a pre-test should be done to confirm whether any damage to the LED's will occur °C

### (5) Static Electricity

Static electricity or surge voltage damages the LED's. It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LED's. All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LED's. When inspecting the final products in which LED's were assembled, it is recommended to check. Whether the assembled LED's are damaged by static electricity or not, it is easy to find static-damaged LED's by a light -on test or a VF test at a lower current (below 1mA is recommended). Damaged LED's will show some unusual characteristics such as the leak current remarkably increases, the forward voltage becomes lower, or the LED's do not light at the low current. Criteria ( $V_f > 2.0V$  at  $I_f = 0.5mA$ )

### (6) Others

Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LED's with matrix drive. The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly at the LED's with unaided eyes for more than a few seconds. Flashing lights have been known to cause discomfort in people, you can prevent this by taking precautions during use. Also, people should be cautions when using equipment that has had LED's incorporated into it. The LED's described in this brochure are intended to be used for ordinary electronic equipment (such as office equipment , communications equipment, measurement instruments and household appliances) Consult Oasistek'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 LED's may directly jeopardize life or health (such as for airplanes, aerospace, submersible repeaters, nuclear reactor control systems, automobile, traffic control equipment, life support systems and safety devices). User shall not reverse engineer by disassembling or analysis of the LED's without having prior written consent from Oasistek when defective LED's are found, the User shall inform Oasistek directly before disassembling or analysis. The formal specifications must be exchanged and signed by both parties before large volume purchase begins.