(1)Storage

• The LEDs should be stared at 30℃ or less and 70%RH or less after being shipped and the storage life limits are 3 months. If the LEDs are stored for 3 months or more, they can be stored for a year in a sealed container with a nitrogen atmosphere and moisture absorbent material.

• leadframes are silver plated Fe or Copper alloy. The silver surface may be affected by environments which contain corrosive substances. Please avoid conditions which may cause LEDs to corrode, tarnish or discolor. This corrosion or discoloration may cause difficulty during soldering operations. It is recommended that the LEDs be used as soon as possible.

• Please avoid rapid transitions in ambient temperature, especially, in high humidity environments where condensation can occur.

(2)Heat Generation

• Thermal design of the end product is of paramount importance. Please consider the heat generation of the LEDs 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 LEDs placement on the board, as well as other components. It is necessary to avoid intense heat generation and operating current should be decided after considering the ambient maximum temperature of LEDs.

(3) LED Mounting method

• The Lead pitch of the led must match the pitch of the mounting holes on the PCB during component placement. Lead-forming may be required to insure the lead pitch matches the hole pitch. Refer to the figure below for proper lead forming procedures.

(Fig. 1)

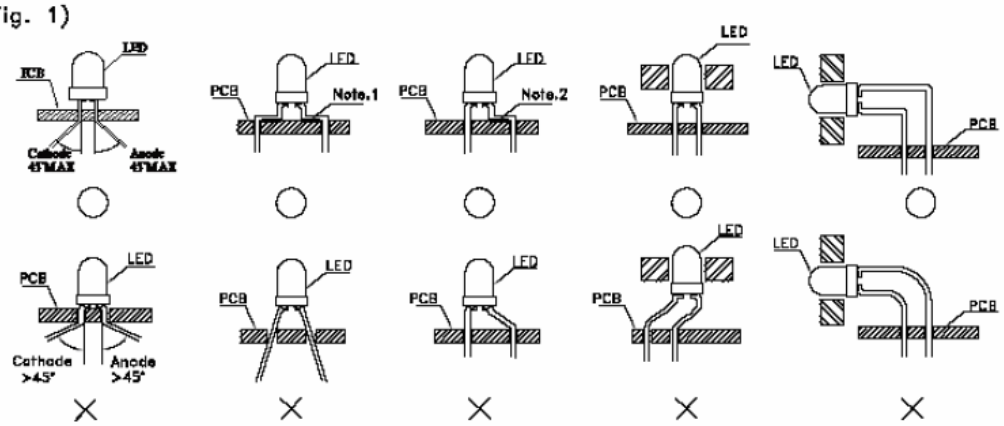

Fig.1

"○" Correct mounting method. "×" Incorrect mounting method.

Note 1-2: Do not route PCB trace in the contact area between the leadframe and the PCB to prevent Short-Circuits.

• When soldering wire to LEDs, Use individual heat-shrink tubing to insulate the exposed leads to prevent accidental contact short-circuit.

(Fig. 2)

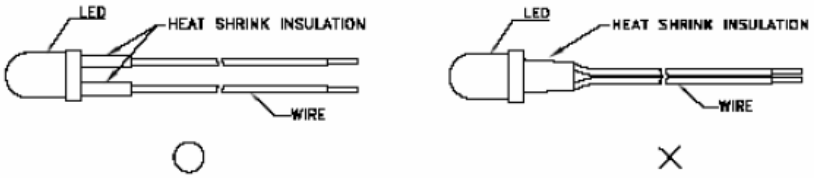

Fig. 2

• Use stand-offs(Fig.3) or spacers (Fig.4) to securely position the LED above the PCB.

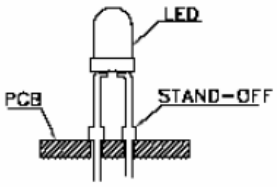

Fig. 3

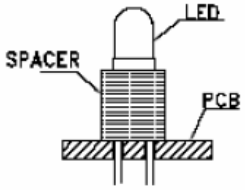

Fig. 4

(4) Lead Forming Procedures

• Maintain a minimum of the 3mm clearance between the base of LEDs lens and the first lead bend(Fig 5 and 6)

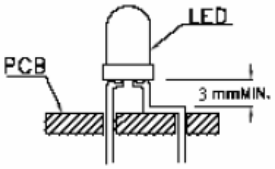

Fig. 5

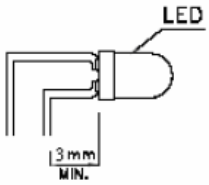

Fig. 6

• Lead forming or bending must be performed before soldering, never during or after soldering.

• Do not stress the LED lens during lead-forming in order to fractures in the lens epoxy and damage the internal structures.

• During lead forming, use fools or jigs to hold the leads securely so that the bending force will not be transmitted to the LED lens and its internal structures. Do not perform lead forming once the component has been mounted onto the PCB(Fig. 7)

• Do not bend the Leads more than twice. (Fig.8)

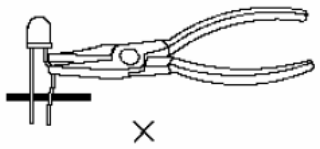

Fig. 7

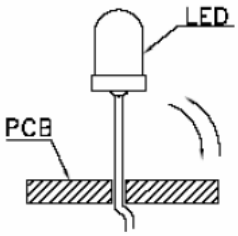

Fig. 8

• After soldering or other high-temperature assembly, allow the led to cool down to 50℃ before applying outside force (Fig.9). In general, avoid placing excess force on the LED to avoid damage.

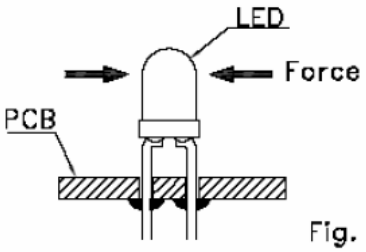

Fig. 9

(5)Soldering Conditions

leadframes are silver plated Fe /copper alloy. This substance has a low thermal coefficient (easily conducts heat). Careful attention should be paid during soldering.

• Solder the LEDs no closer than 3mm from the base of the epoxy bulb. Soldering beyond the base of the tie bar is recommended.

• Recommended soldering conditions

Dip Soldering		Hand Soldering	
Pre-Heat	120℃ Max.	Temperature	350℃ Max.
Pre-Heat Time	60 seconds Max.	Soldering Time	3 seconds Max.
Solder Bath Temperature	260℃ Max.	Position	No closer than 3 mm from the base of the epoxy bulb.
Dipping Time	**5 seconds Max.**		
Dipping Position	No lower than 3mm from the base of the epoxy bulb.		

• Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the LEDs

• A rapid-rate process is not recommended for cooling the LEDs .own from the peak temperature.

• Dip soldering should not be done more than one time.

• Hand soldering should not be done more than one time.

• Do not apply any stress to the lead particularly when heated.
• The LEDs must not be repositioned after soldering.
• After soldering the LEDs, the epoxy bulb should be protected from mechanical shock or vibration until the LEDs return to room temperature.
• Direct soldering onto a PC board should be avoided. Mechanical stress to the resin may be caused from warping of the PC board or from the clinching and cutting of the leadframes. When it is absolutely necessary, the LEDs may be mounted in this fashion but the User will assume responsibility for any problems. Direct soldering should only be done after testing has confirmed that no damage, such as wire bond failure or resin deterioration, will occur. LEDs should not be soldered directly to double sided PC boards because the heat will deteriorate the epoxy resin.
• When it is necessary to clamp the LEDs to prevent soldering failure, it is important to minimize the mechanical stress on the LEDs.
• Cut the LEDs leadframes at room temperature. Cutting the leadframes at high temperatures may cause failure of the LEDs.

(6)Cleaning

• It is recommended that isopropyl alcohol be used as a solvent for cleaning LEDs. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the resin or not. Freon solvents should not be used to clean the LEDs because of worldwide regulations.
• Do not clean the LEDs by the ultrasonic. When it is absolutely necessary, the influence of ultrasonic cleaning on the LEDs 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 LEDs will occur.

(7)Static Electricity

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

Criteria: (VF >2.0V at IF=0.5mA)

(8) Others

· The LED complies with RoHS and REACH Directive.
· The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly at the LEDs 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 cautious when using equipment that has had LEDs incorporated into it.