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**DATA SHEET**

**PART NO. : L-31ROPT1D2**

**REV : A / 1**

CUSTOMER'S APPROVAL : \_\_\_\_\_

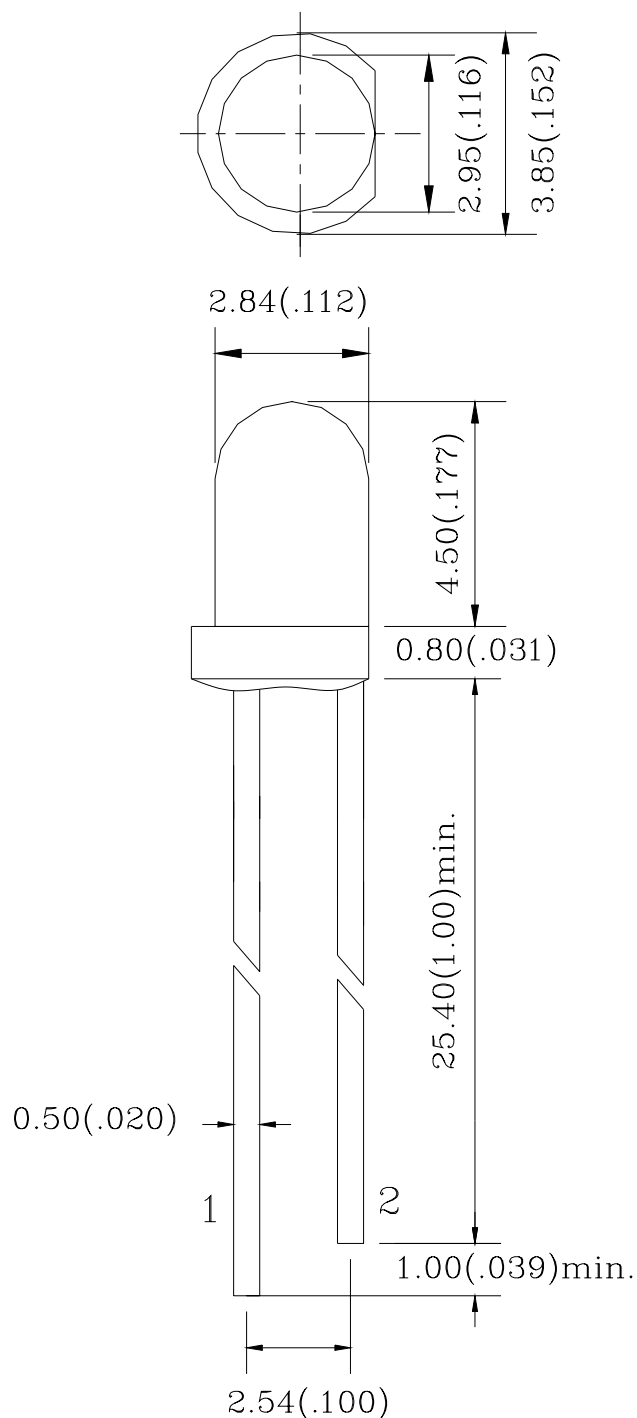
DCC : \_\_\_\_\_

DRAWING NO. : DS-21-02-0004

DATE : 2005-04-22

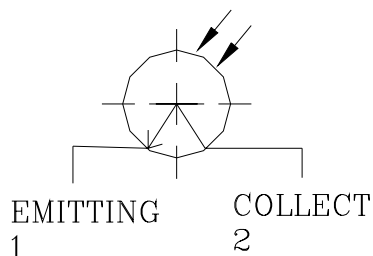
Page : 1

## PACKAGE DIMENSIONS



## Note:

- 1.All Dimensions are in millimeters.
- 2.Tolerance is  $\pm 0.25\text{mm}$ (0.010 ") Unless otherwise specified.
- 3.Protruded resin under flange is 1.5mm(0.059 ") max.
- 4.Lead spacing is measured where the leads emerge from the package.
- 5.Specification are subject to change without notice



#### FEATURES

- \* WIDE RANGE COLLECTOR CURRENTS
- \* LENSED FOR HIGH SENSITIVITY
- \* HIGH-OUTPUT POWER
- \* HIGH-SPEED RESPONSE
- \* Pb FREE PRODUCTS

#### CHIP MATERIALS

- \* SILICON

#### ABSOLUTE MAXIMUM RATING : ( Ta = 25°C )

| SYMBOL   | PARAMETER                           | MAX           | UNIT |
|----------|-------------------------------------|---------------|------|
| PD       | Power Dissipation                   | 10            | mW   |
| V(BR)CEO | Collector-Emitter Breakdown Voltage | 30            | V    |
| Topr     | Operating Temperature Range         | -35°C to 85°C |      |
| Tstg     | Storage Temperature Range           | -35°C to 85°C |      |

Lead Soldering Temperature { 1.6mm(0.063 inch) From Body } 260°C ± 5°C for 5 Seconds

#### ELECTRO-OPTICAL CHARACTERISTICS : ( Ta = 25°C )

| SYMBOL | PARAMETER                            | TEST CONDITION                          | MIN. | TYP   | MAX. | UNIT |
|--------|--------------------------------------|-----------------------------------------|------|-------|------|------|
| BVCEO  | Collector-Emitter Breakdown Voltage  | Ic = 100μA<br>Ee = 0 mw/cm <sup>2</sup> | 30   |       |      | V    |
| BVECO  | Emitter-Collector Breakdown Voltage  | IE=100μA<br>Ee = 0 mw/cm <sup>2</sup>   | 5    |       |      | V    |
| ICEO   | Collector Dark Current               | VCE=10V<br>Ee=0 mw/cm <sup>2</sup>      |      |       | 100  | nA   |
| VCE(S) | Collector-Emitter Saturation Voltage | IC=2mA<br>Ee=0.5 mw/cm <sup>2</sup>     |      |       | 0.4  | V    |
| TR/TF  | Rise / Fall Time                     | VCE=5V<br>IC=1mA<br>RL=1000 Ω           |      | 15/15 |      | uS   |
| IC     | On Stat Collector Current            | VCE=5V<br>Ee=0.1 mw/cm <sup>2</sup>     |      | 2     |      | mA   |
| λP     | Spectral Sensitivity Wavelength      |                                         |      | 940   |      | nm   |

Fig. 1 Collector Power Dissipation vs. Ambient Temperature

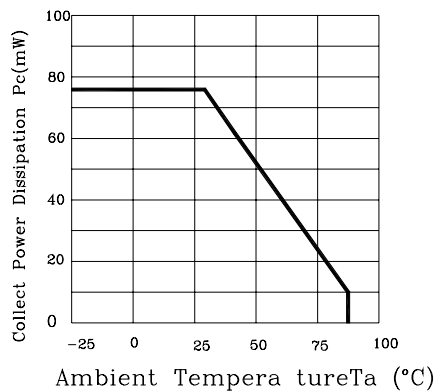


Fig. 2 Collector Dark Current vs. Ambient Temperature

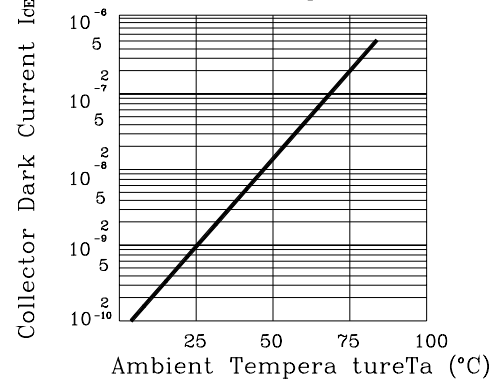


Fig. 3 Relative Collector Current vs. Ambient Temperature

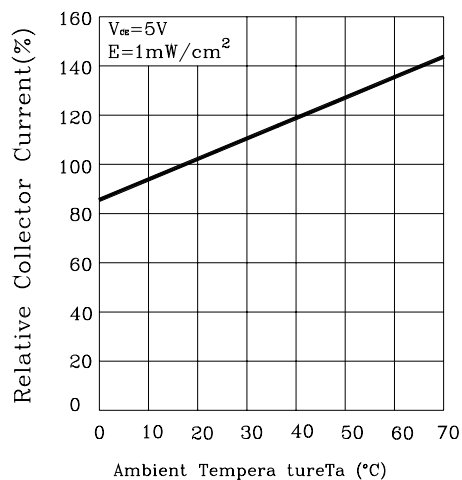


Fig. 4 Collector current vs Irradiance

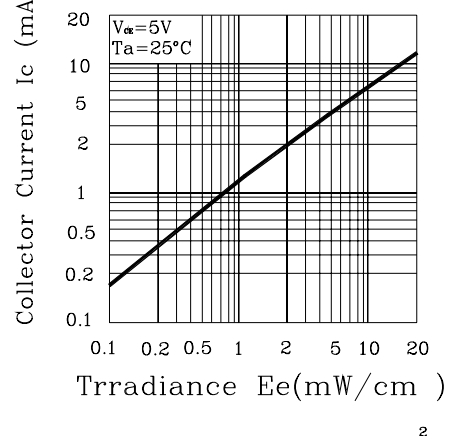


Fig. 5 Spectral Sensitivity

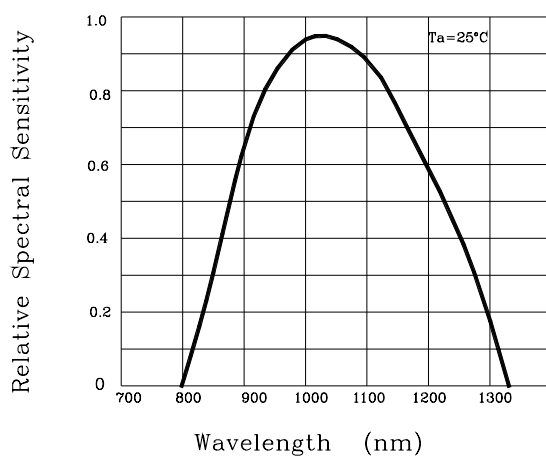
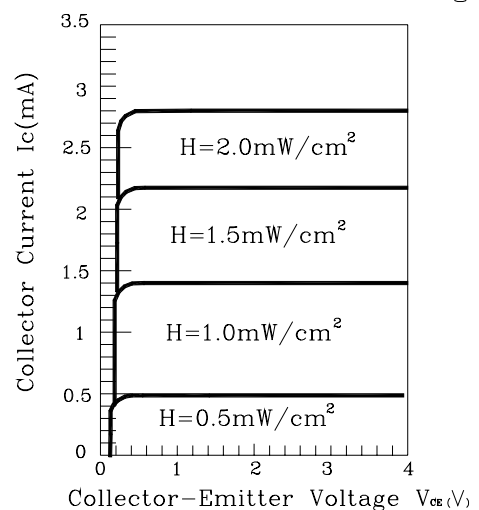


Fig. 6 Collector Current vs Collector-Emitter Voltage





3.0 mm PHOTOTRANSISTOR

L-31ROPT1D2

REV:A / 1

## Label Explanation

|                                                                                                                                 |           |
|---------------------------------------------------------------------------------------------------------------------------------|-----------|
|  光鼎电子股份有限公司<br>PARA LIGHT ELECTRONICS CO.,LTD. |           |
| PARA NO. :                                                                                                                      |           |
| LOT NO. :                                                                                                                       | INSPECTED |
| BIN :                                                                                                                           |           |
| Q' TY : PCS                                                                                                                     |           |
| N. W : g                                                                                                                        |           |

PARA NO. : Refer to p11

LOT NO. : **E L L 4 7 0009**

A B C D E F

A---E: For series number

B---L: Local F: Foreign

C---L: LAMP

D---Year

E---Month

F---SPEC.

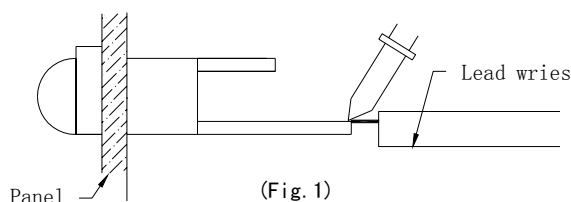
Q'TY : Below are standard specification, actual packing quantity reference page 12

N'W : Net Weight

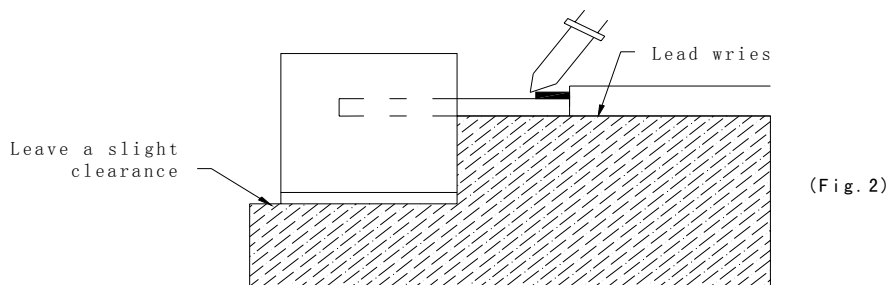
•**SOLDERING**

| METHOD            | SOLDERING CONDITIONS                                                                                                          | REMARK                                                                                                                                                                                                                                                  |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DIP<br>SOLDERING  | Bath temperature: $260 \pm 5^{\circ}\text{C}$<br>Immersion time: with 5 sec                                                   | <ul style="list-style-type: none"> <li>Solder no closer than 3mm from the base of the package</li> <li>Using soldering flux," RESIN FLUX" is recommended.</li> </ul>                                                                                    |
| SOLDERING<br>IRON | Soldering iron: 30W or smaller<br>Temperature at tip of iron: $260^{\circ}\text{C}$ or lower<br>Soldering time: within 5 sec. | <ul style="list-style-type: none"> <li>During soldering, take care not to press the tip of iron against the lead.</li> </ul> <p>(To prevent heat from being transferred directly to the lead, hold the lead with a pair of tweezers while soldering</p> |

- 1) When soldering the lead of LED in a condition that the package is fixed with a panel (See Fig.1), be careful not to stress the leads with iron tip.

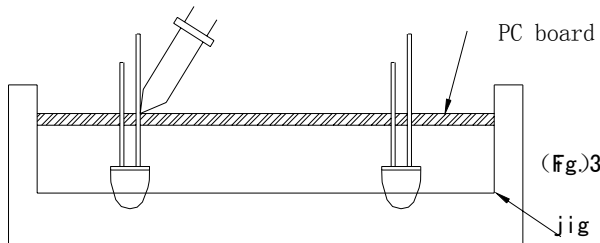


- 2) When soldering wire to the lead, work with a Fig (See Fig.2) to avoid stressing the package.



Regarding solution in the tinning oven for product-tinning, compound sub-solution made of tin & copper and silver is proposed with the temperature of Celsius 260. The proportion of the alloyed solution is tin 95.5: copper 3.5: silver 0.5 by percentage. The time of tinning is constantly 3 seconds.

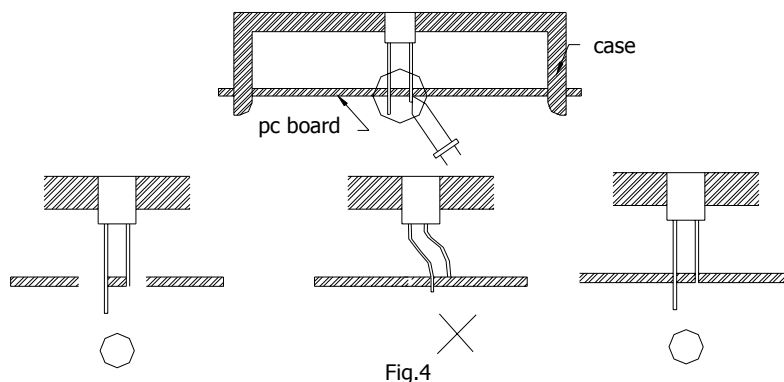
- 3) Similarly, when a jig is used to solder the LED to PC board, take care as much as possible to avoid steering the leads (See Fig.3).



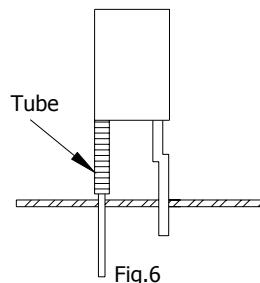
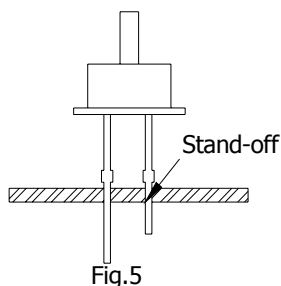
- 4) Repositioning after soldering should be avoided as much as possible. If inevitable, be sure to preserve the soldering conditions with irons stated above: select a best-suited method that assures the least stress to the LED.
- 5) Lead cutting after soldering should be performed only after the LED temperature has returned to normal temperature.

### •LED MOUNTING METHOD

- 1) When mounting the LED by using a case, as shown Fig.4, ensure that the mounting holds on the PC board match the pitch of the leads correctly-tolerance of dimensions of the respective components including the LED should be taken into account especially when designing the case, PC board, etc. to prevent pitch misalignment between the leads and board holes, the diameter of the board holes should be slightly larger than the size of the lead. Alternatively, the shape of the holes should be made oval. (See Fig.4)

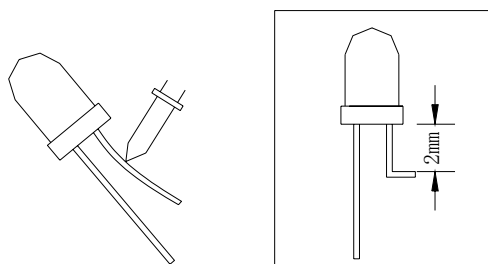


2) Use LEDs with stand-off (Fig.5) or the tube or spacer made of resin (Fig.6) to position the LEDs.

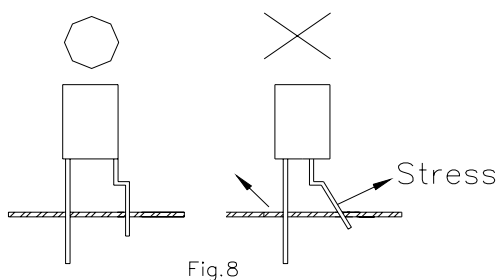


### •FORMED LEAD

1) The lead should be bent at a point located at least 2mm away from the package. Bending should be performed with base fixed means of a jig or pliers (Fig.7)



2) Forming lead should be carried out prior to soldering and never during or after soldering.  
3) Form the lead to ensure alignment between the leads and the hole on board, so that stress against the LED is prevented. (Fig.8)





### •LEAD STRENGTH

#### 1) Bend strength

Do not bend the lead more than twice. (Fig.9)

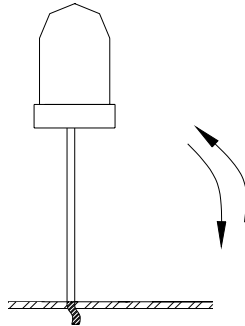


Fig.9

#### 2) Tensile strength (@Room Temperature)

If the force is 1kg or less, there will be no problem. (Fig.10)

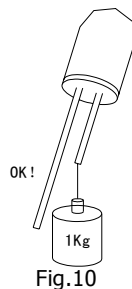


Fig.10

### •HANDLING PRECAUTIONS

Although rigid against vibration, the LEDs may damaged or scratched if dropped. So take care when handling.

### •CHEMICAL RESISTANCE

- 1) Avoid exposure to chemicals as it may attack the LED surface and cause discoloration.
- 2) When washing is required, refer to the following table for the proper chemical to be used.  
(Immersion time: within 3 minutes at room temperature.)

| SOLVENT           | ADAPTABILITY |
|-------------------|--------------|
| Freon TE          | ⊙            |
| Chlorothene       | ×            |
| Isopropyl Alcohol | ⊙            |
| Thinner           | ×            |
| Acetone           | ×            |
| Trichloroethylene | ×            |

⊙--Usable    ×--Do not use.

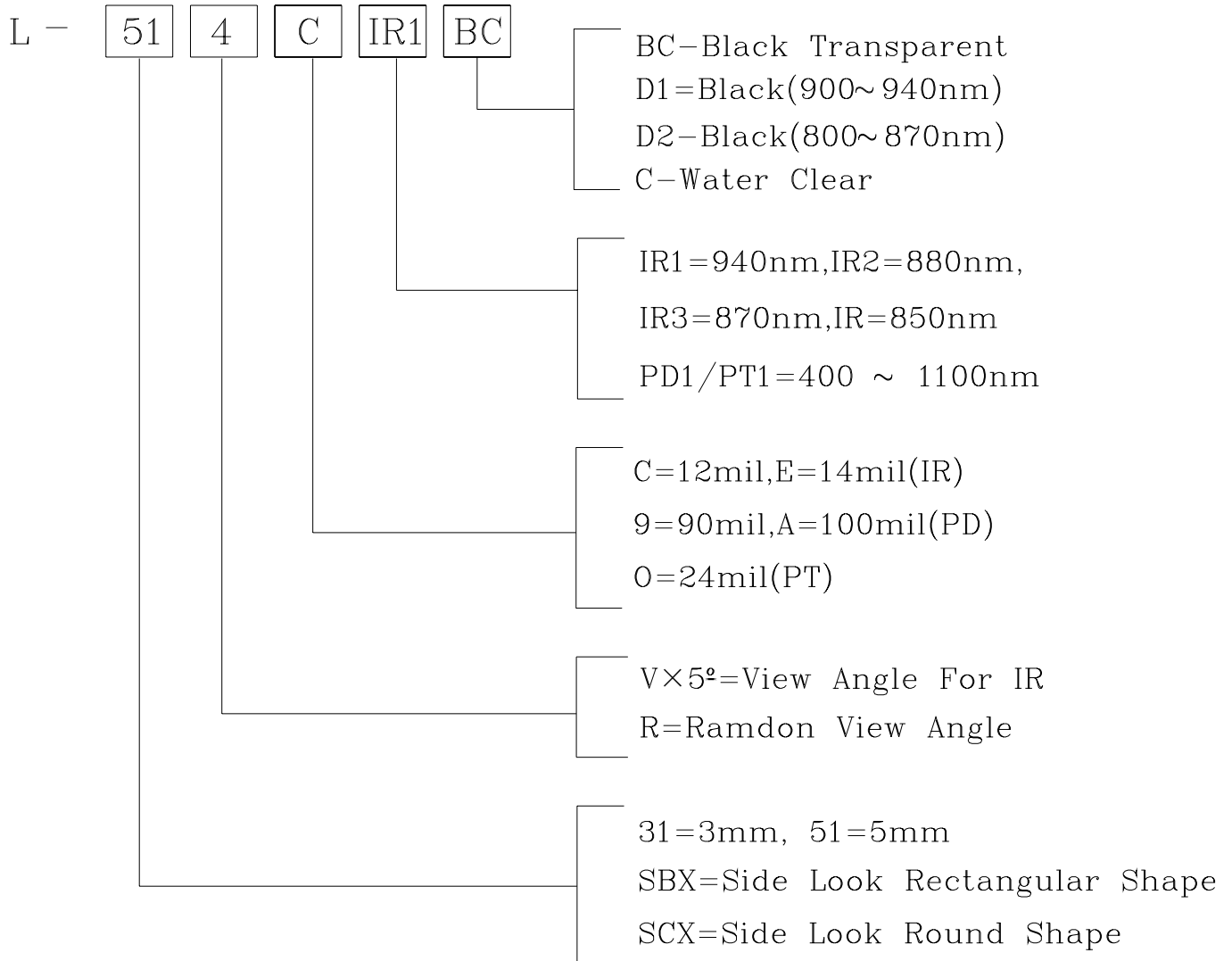
NOTE: Influences of ultrasonic cleaning of the LED resin body differ depending on such factors as the oscillator output, size of the PC board and the way in which the LED is mounted.

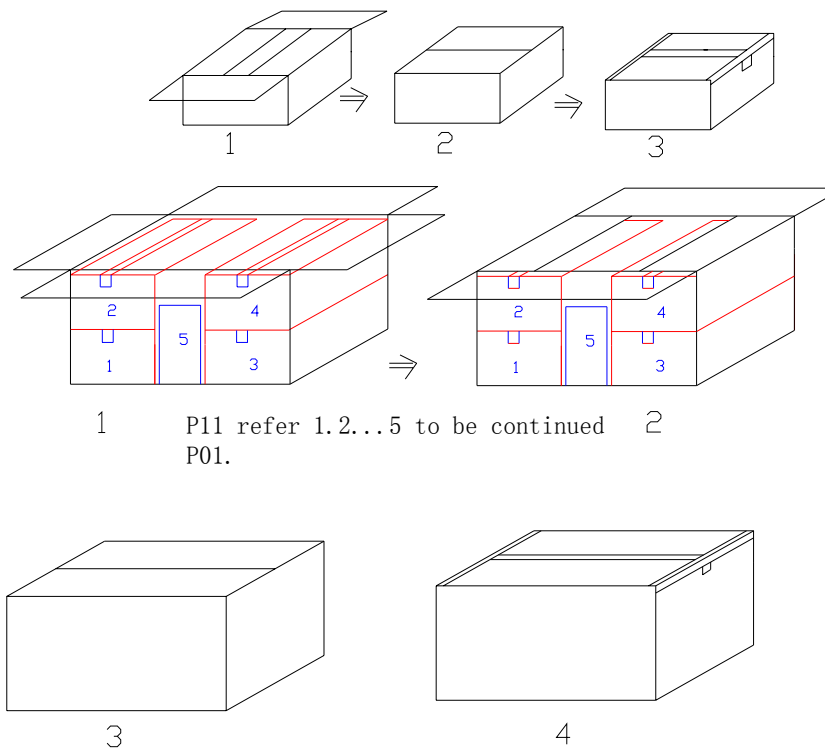
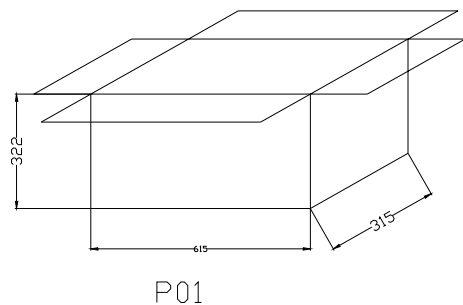
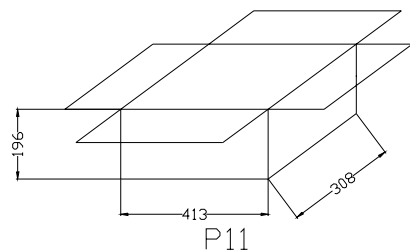
Therefore, ultrasonic cleaning should only be performed after confirming there is no problem by conducting a test under practical.

# Experiment Item:

| Item                                         | Test Condition                                                                                                                                                                                                                                 | Reference Standard                                                                 |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                              | Lamp & IR                                                                                                                                                                                                                                      |                                                                                    |
| OPERATION LIFE                               | Ta : $25\pm 5^{\circ}\text{C}$<br>IF = 20mA RH : $\leq 60\% \text{RH}$<br>① DYNAMIC: 100mA 1ms 1/10 duty<br>② STATIC STATE: IF = 20mA<br>TEST TIME:<br>168HRS ( -24HRS , +24HRS )<br>500HRS ( -24HRS , +24HRS )<br>1000HRS ( -24HRS , +72HRS ) | MIL-STD-750 : 1026<br>MIL-STD-883 : 1005<br>JIS C 7021 : B-1                       |
| HIGH TEMPERATURE<br>HIGH HUMIDITY<br>STORAGE | Ta : $65^{\circ}\text{C}\pm 5^{\circ}\text{C}$<br>RH : 90~95%RH<br>TEST TIME : 240HRS $\pm$ 2HRS                                                                                                                                               | MIL-STD-202 : 103B<br>JIS C 7021 : B-1                                             |
| TEMPERATURE<br>CYCLING                       | $105^{\circ}\text{C} \sim 25^{\circ}\text{C} \sim -55^{\circ}\text{C} \sim 25^{\circ}\text{C}$<br>30min 5min 30min 5min<br>10CYCLES                                                                                                            | MIL-STD-202 : 107D<br>MIL-STD-750 : 1051<br>MIL-STD-883 : 1010<br>JIS C 7021 : A-4 |
| THERMAL SHOCK                                | $105^{\circ}\text{C}\pm 5^{\circ}\text{C} \sim -55^{\circ}\text{C}\pm 5^{\circ}\text{C}$<br>10min 10min<br>10CYCLES                                                                                                                            | MIL-STD-202 : 107D<br>MIL-STD-750 : 1051<br>MIL-SYD-883 : 1011                     |
| SOLDER<br>RESISTANCE                         | T , sol : $260^{\circ}\text{C}\pm 5^{\circ}\text{C}$<br>DWELL TIME : 10 $\pm$ 1sec                                                                                                                                                             | MIL-STD-202 : 210A<br>MIL-STD-750-2031<br>JIS C 7021 : A-1                         |
| SOLDERABILITY                                | T , sol : $230^{\circ}\text{C}\pm 5^{\circ}\text{C}$<br>DWELL TIME : 5 $\pm$ 1sec                                                                                                                                                              | MIL-STD-202 : 208D<br>MIL-STD-750 : 2026<br>MIL-STD-883 : 2003<br>JIS C 7021 : A-2 |

**LED Lamps:**





L-31ROPT1D2 package rule Note:

- 1、 P11 presents little package box ,18little bags in every P11,1000PCS in every bag.
- 2、 P01 presents big package box, five little P11 boxes in every P01,total 90KPCS in every P01.
- 3、 Specific package course refers to the attached graph.