



# Through Hole Lamp Product Data Sheet

## LTL30EKDFGJ-004A

Spec No.: DS20-2007-0124

Effective Date: 07/30/2009

Revision: A

LITE-ON DCC

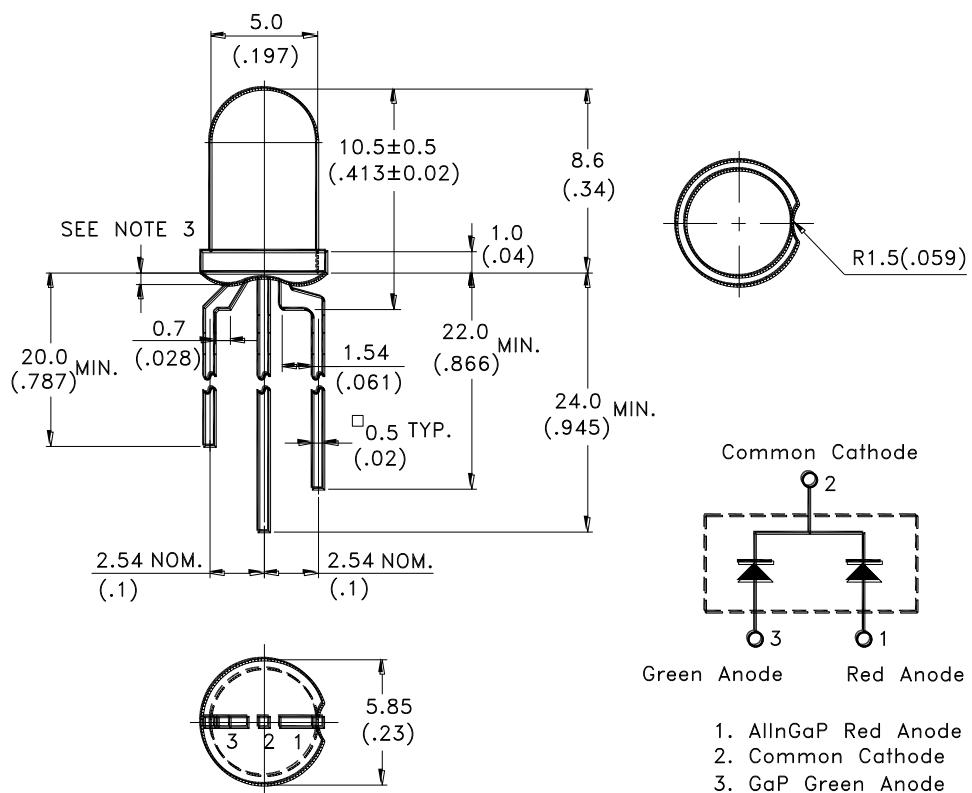
RELEASE

BNS-OD-FC001/A4

## Features

- \* AlInGaP Red and Gap Green chips are matched for uniform light output.
- \* T-1 3/4 type package.
- \* Long life-solid state reliability.
- \* Low power consumption.
- \* Pb Free and RoHS compliant

## Package Dimensions



| Part No.         | Lens           | Source Color            |
|------------------|----------------|-------------------------|
| LTL30EKDFGJ-004A | White Diffused | AllnGaP Red / GaP Green |

### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (.010") unless otherwise noted.
3. Protruded resin under flange is 1.0mm (.04") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specification is subject to change without notice.

**Absolute Maximum Ratings at TA=25°C**

| Parameter  | AllnGaP Red         | GaP Green | Unit  |
|--|---------------------|-----------|-------|
| Power Dissipation  | 75                  | 120       | mW    |
| Peak Forward Current<br>(1/10 Duty Cycle, 0.1ms Pulse Width) | 90                  | 90        | mA    |
| Continuous Forward Current                                   | 30                  | 30        | mA    |
| Derating Linear From 50°C                                    | 0.4                 | 0.4       | mA/°C |
| Reverse Voltage  | 5                   | 5         | V     |
| Operating Temperature Range                                  | -55°C to + 100°C    |           |       |
| Storage Temperature Range                                    | -55°C to + 100°C    |           |       |
| Lead Soldering Temperature<br>[2.0 mm(.078") From Body]      | 260°C for 5 Seconds |           |       |

## Electrical Optical Characteristics at TA=25°C

| Parameter                | Symbol            | Color        | Min.       | Typ.       | Max.       | Unit | Test Condition   |
|--------------------------|-------------------|--------------|------------|------------|------------|------|--|
| Luminous Intensity       | I <sub>V</sub>    | Red<br>Green | 110<br>30  | 180<br>50  | 310<br>85  | mcd  | I <sub>F</sub> = 20mA<br>I <sub>F</sub> = 20mA<br>Note 1,4 |
| Viewing Angle            | 2θ <sub>1/2</sub> | Red<br>Green |            | 30<br>30   |            | deg  | Note 2 (Fig.6)   |
| Peak Emission            | λ <sub>P</sub>    | Red<br>Green |            | 650<br>565 |            | nm   | Measurement<br>@Peak (Fig.1)                               |
| Dominant Wavelength      | λ <sub>d</sub>    | Red<br>Green | 634<br>563 | 639<br>569 | 644<br>580 | nm   | Note 3   |
| Spectral Line Half-Width | Δλ                | Red<br>Green |            | 20<br>30   |            | nm   |  |
| Forward Voltage          | V <sub>F</sub>    | Red<br>Green |            | 2.0<br>2.1 | 2.4<br>2.6 | V    | I <sub>F</sub> = 20mA                                      |
| Reverse Current          | I <sub>R</sub>    | Red<br>Green |            |            | 100        | μA   | V <sub>R</sub> = 5V  |
| Capacitance              | C                 | Red<br>Green |            | 80<br>35   |            | pF   | V <sub>F</sub> = 0, f = 1MHz                               |

- Note:
1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission International De L'Eclairage) eye-response curve.
  2. θ<sub>1/2</sub> is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
  3. The dominant wavelength, λ<sub>d</sub> is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
  4. The I<sub>V</sub> guarantee should be added ±15%.

## Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

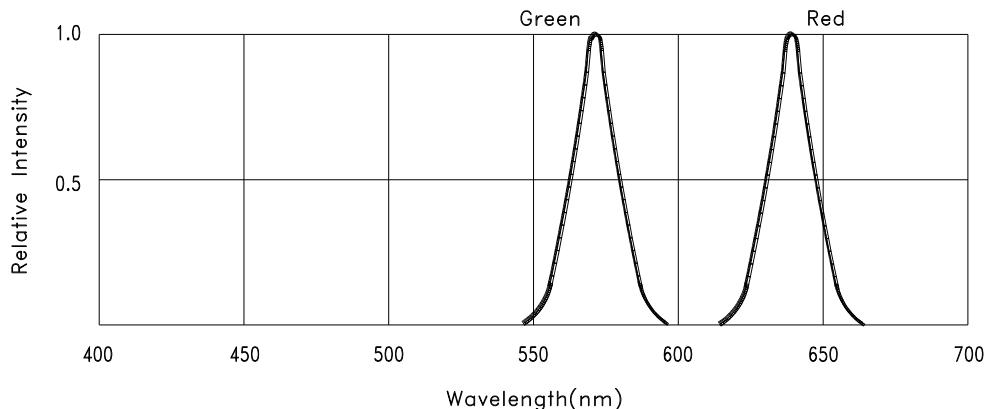


Fig.1 Relative Intensity vs. Wavelength

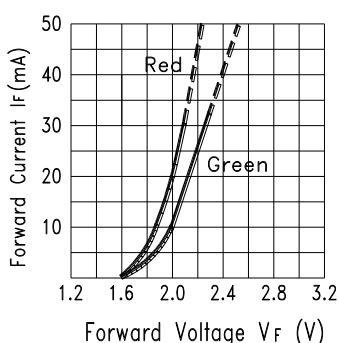


Fig.2 Forward Current vs. Forward Voltage

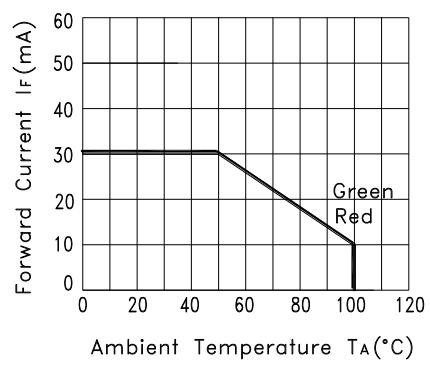


Fig.3 Forward Current Derating Curve

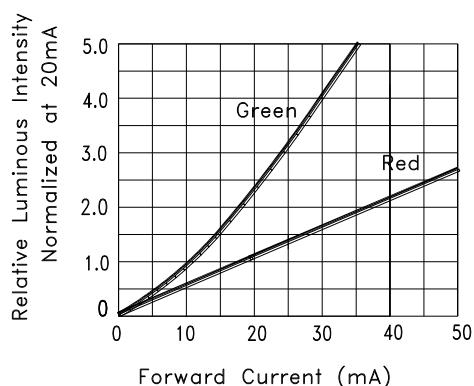


Fig.4 Relative Luminous Intensity vs. Forward Current

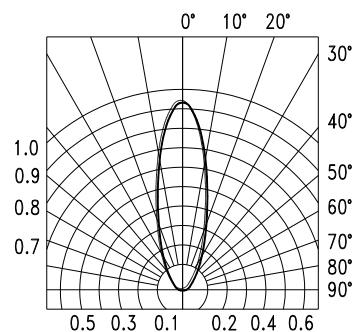


Fig.5 Spatial Distribution

**Bin Table Specifications**

| <b>Luminous Intensity AllnGaP Red Unit : mcd @20mA</b> |             |             |
|--|-------------|-------------|
| <b>Bin Code</b>  | <b>Min.</b> | <b>Max.</b> |
| F  | 110         | 140         |
| G  | 140         | 180         |
| H  | 180         | 240         |
| J  | 240         | 310         |

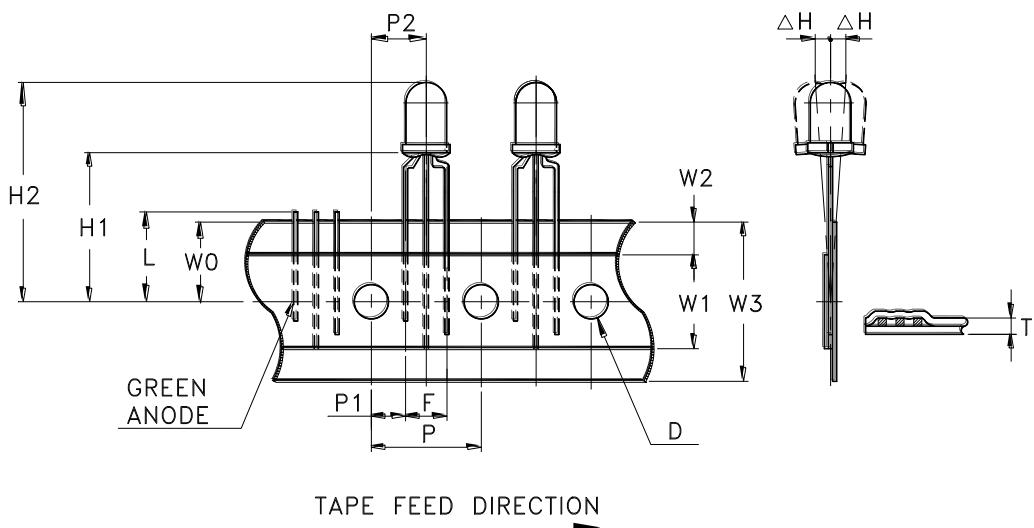
| <b>Luminous Intensity GaP Green Unit : mcd @20mA</b> |             |             |
|--|-------------|-------------|
| <b>Bin Code</b>                                      | <b>Min.</b> | <b>Max.</b> |
| A  | 30          | 38          |
| B  | 38          | 50          |
| C  | 50          | 65          |
| D  | 65          | 85          |

Note: Tolerance of each bin limit is  $\pm 15\%$

Bin Code : X-X (Luminous Intensity RED– Luminous Intensity GREEN)

**Features**

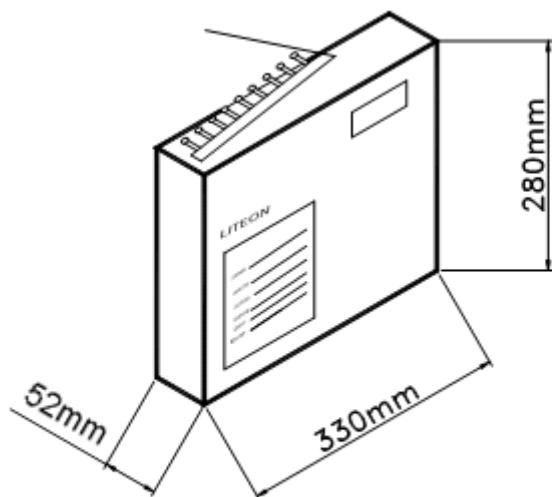
- \* Compatible with radial lead automatic insertion equipment.
- \* Most radial lead plastic lead lamps available packaged in tape and reel.
- \* 3 Leads with 2.54mm (0.1") straight lead spacing available.
- \* Folding packaging simplifies handling and testing.

**Package Dimensions**

| Item                                  | Symbol | Specification |       |         |       |
|---------------------------------------|--------|---------------|-------|---------|-------|
|                                       |        | Minimum       |       | Maximum |       |
|                                       |        | mm            | inch  | mm      | inch  |
| Tape Feed Hole Diameter               | D      | 3.8           | 0.149 | 4.2     | 0.165 |
| Component Lead Pitch                  | F      | 4.8           | 0.188 | 5.8     | 0.228 |
| Front to Rear Deflection              | △H     | --            | --    | 2.0     | 0.078 |
| Feed Hole to Bottom of Component      | H1     | 17.5          | 0.688 | 18.5    | 0.728 |
| Feed Hole to Overall Component Height | H2     | 25.8          | 1.016 | 27.4    | 1.079 |
| Lead Length after Component Height    | L      | W0            |       | 11.0    | 0.433 |
| Feed Hole Pitch                       | P      | 12.4          | 0.488 | 13.0    | 0.511 |
| Lead Location                         | P1     | 3.15          | 0.124 | 4.55    | 0.179 |
| Center of Component Location          | P2     | 5.05          | 0.198 | 7.65    | 0.301 |
| Total Taped Thickness                 | T      | --            | --    | 0.90    | 0.035 |
| Feed Hole Location                    | W0     | 8.5           | 0.334 | 9.75    | 0.384 |
| Adhesive Tape Width                   | W1     | 14.5          | 0.571 | 15.5    | 0.610 |
| Adhesive Tape Position                | W2     | 0             | 0     | 3.0     | 0.118 |
| Tape Width                            | W3     | 17.5          | 0.689 | 19.0    | 0.748 |

### Packing Spec

**2000 pcs per inner carton**

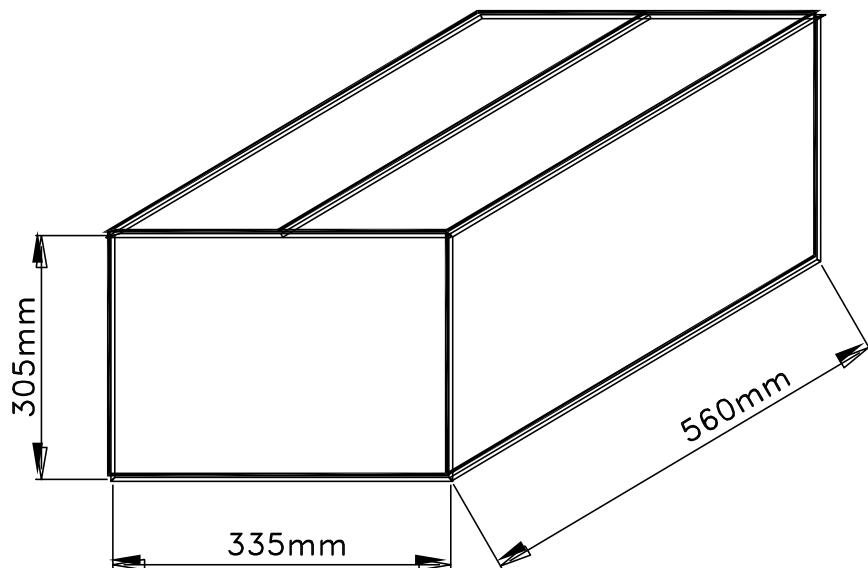


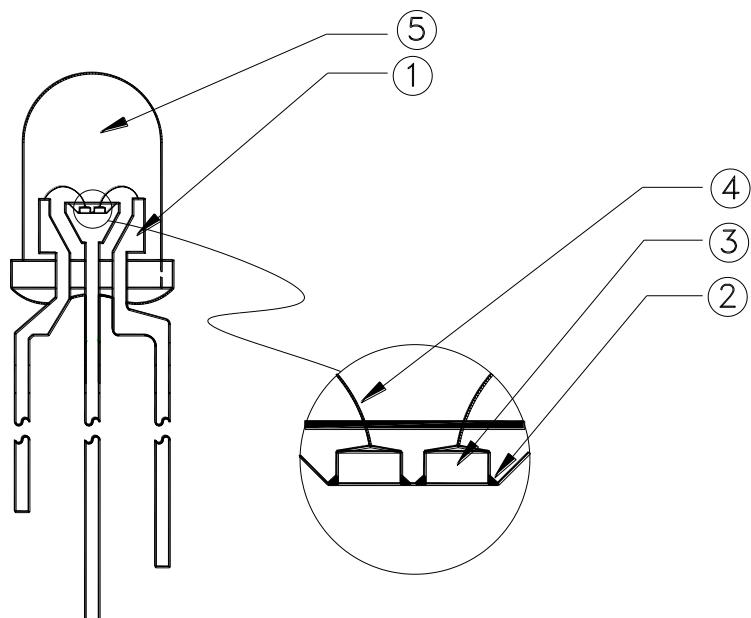
**Tolerance:  $\pm 5\text{mm}$**

**10 Inner cartons per outer carton**

**total 20000 pcs per outer carton**

**In every shipping lot, only the last pack will be non-full packing**



***Cross Section & Material List***

| No. | Items                    | Material                                      |
|-----|--------------------------|---|
| 1   | Lead Frame (Taiwan)      | Iron /W Copper + Silver Plating / Solder Dip. |
|     | Vendor :                 | ICHIUN PRECISION INDUSTRY CO.,LTD.            |
| 2   | Die Bond (Singapore)     | Ag Paste                                      |
|     | Vendor :                 | SMM Bakelite Singapore                        |
| 3   | LED Chip (Taiwan)        | AllnGaP Red, GaP Green                        |
|     | Vendor :                 | EPISTAR ,OTC                                  |
| 4   | Bonding Wire (Singapore) | Au Wire                                       |
|     | Vendor :                 | SUMITOMO                                      |
| 5   | Resin (Taiwan)           | Epoxy Resin / Hardener                        |
|     | Vendor :                 | ECLAT   |
| 6   | Product Weight           | About 0.36g                                   |

## CAUTIONS

### 1. Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Liteon's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

### 2. Storage

The storage ambient for the LEDs should not exceed 30°C temperature or 70% relative humidity. It is recommended that LEDs out of their original packaging are used within three months. For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant or in desiccators with nitrogen ambient.

### 3. Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LEDs if necessary.

### 4. Lead Forming & Assembly

During lead forming, the leads should be bent at a point at least 3mm from the base of LED lens. Do not use the base of the lead frame as a fulcrum during forming. Lead forming must be done before soldering, at normal temperature. During assembly on PCB, use minimum clinch force possible to avoid excessive mechanical stress.

### 5. Soldering

When soldering, leave a minimum of 2mm clearance from the base of the lens to the soldering point. Dipping the lens into the solder must be avoided.

Do not apply any external stress to the lead frame during soldering while the LED is at high temperature.

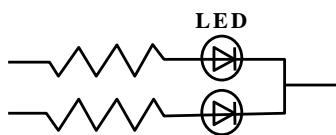
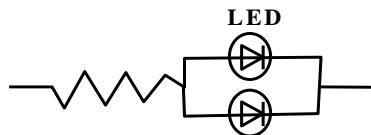
Recommended soldering conditions :

| Soldering iron                |  | Wave soldering   |   |
|-------------------------------|--|--|---|
| Temperature<br>Soldering time | 350 ~ 400°C Max.<br>3.2 mm.<br>3.0 Sce Max.<br>(one time only) | Pre-heat<br>Pre-heat time<br>Solder wave<br>Soldering time | 100°C Max.<br>60 sec. Max.<br>260°C Max.<br>5 sec. Max. |

Note: Excessive soldering temperature and/or time might result in deformation of the LED lens or catastrophic failure of the LED

## 6. Drive Method

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

**Circuit model A****Circuit model B**

(A) Recommended circuit

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs

**7. Reliability Test**

| Classification     | Test Item                                   | Test Condition   | Reference Standard   |
|--------------------|---|--|--|
| Endurance Test     | Operation Life                              | Ta= Under Room Temperature As Per Data Sheet Maximum Rating<br>*Test Time= 1000HRS (-24HRS,+72HRS) | MIL-STD-750D:1026 (1995)<br>MIL-STD-883D:1005 (1991)<br>JIS C 7021:B-1 (1982)                            |
|                    | High Temperature High Humidity Storage      | Ta= $65 \pm 5^{\circ}\text{C}$<br>RH= 90 ~ 95%<br>Test Time= 240HRS $\pm$ 2HRS                     | MIL-STD-202F: 103B(1980)<br>JIS C 7021 : B-11(1982)  |
|                    | High Temperature High Humidity Reverse BIAS | Ta= $65 \pm 5^{\circ}\text{C}$<br>RH= 90 ~ 95%<br>VR=5V<br>Test Time = 500HRS (-24HRS, +48HRS)     | JIS C 7021 : B-11(1982)  |
|                    | High Temperature Storage                    | Ta= $105 \pm 5^{\circ}\text{C}$<br>*Test Time= 1000HRS (-24HRS,+72HRS)                             | MIL-STD-883D:1008 (1991)<br>JIS C 7021:B-10 (1982)   |
|                    | Low Temperature Storage                     | Ta= $-55 \pm 5^{\circ}\text{C}$<br>*Test Time=1000HRS (-24HRS,+72HRS)                              | JIS C 7021:B-12 (1982)   |
| Environmental Test | Temperature Cycling                         | 105°C ~ 25°C ~ -55°C ~ 25°C<br>30mins 5mins 30mins 5mins<br>10 Cycles                              | MIL-STD-202F:107D (1980)<br>MIL-STD-750D:1051(1995)<br>MIL-STD-883D:1010 (1991)<br>JIS C 7021: A-4(1982) |
|                    | Thermal Shock                               | 105 $\pm$ 5°C ~ -55°C $\pm$ 5°C<br>10mins 10mins<br>10 Cycles                                      | MIL-STD-202F:107D(1980)<br>MIL-STD-750D:1051(1995)<br>MIL-STD-883D:1011 (1991)                           |
|                    | Solder Resistance                           | T.sol = 260 °C Max.<br>Dwell Time= 5 secs Max.<br>3 Times dip                                      | MIL-STD-202F:210A(1980)<br>MIL-STD-750D:2031(1995)<br>JIS C 7021: A-1(1982)                              |
|                    | Solderability                               | T. sol = $230 \pm 5^{\circ}\text{C}$<br>Dwell Time= 5 $\pm$ 1secs                                  | MIL-STD-202F:208D(1980)<br>MIL-STD-750D:2026(1995)<br>MIL-STD-883D:2003(1991)<br>JIS C 7021: A-2(1982)   |

**8. Others**

The appearance and specifications of the product may be modified for improvement, without prior notice.