

5mm Full Color Blinking Type LED
Technical Data Sheet

Part No: LL-F506RGBC2E-F1

Features

- ◇ Single lamp with 3 original color (red ,green ,and blue).
- ◇ Triple chips embedded
- ◇ Multiple color compose full spectrums
- ◇ Electricity control IC embedded
- ◇ Fancy, fun, hottest in the market.
- ◇ Lens size with 5mm / 8mm / 10mm options
- ◇ Viewing Angles 60° ..
- ◇ Operating voltage range : 4.5V-10V DC.
- ◇ Blinking frequency : 0.25Hz
- ◇ Frequency tolerance : $\pm 20\%$
- ◇ RoHS compliant

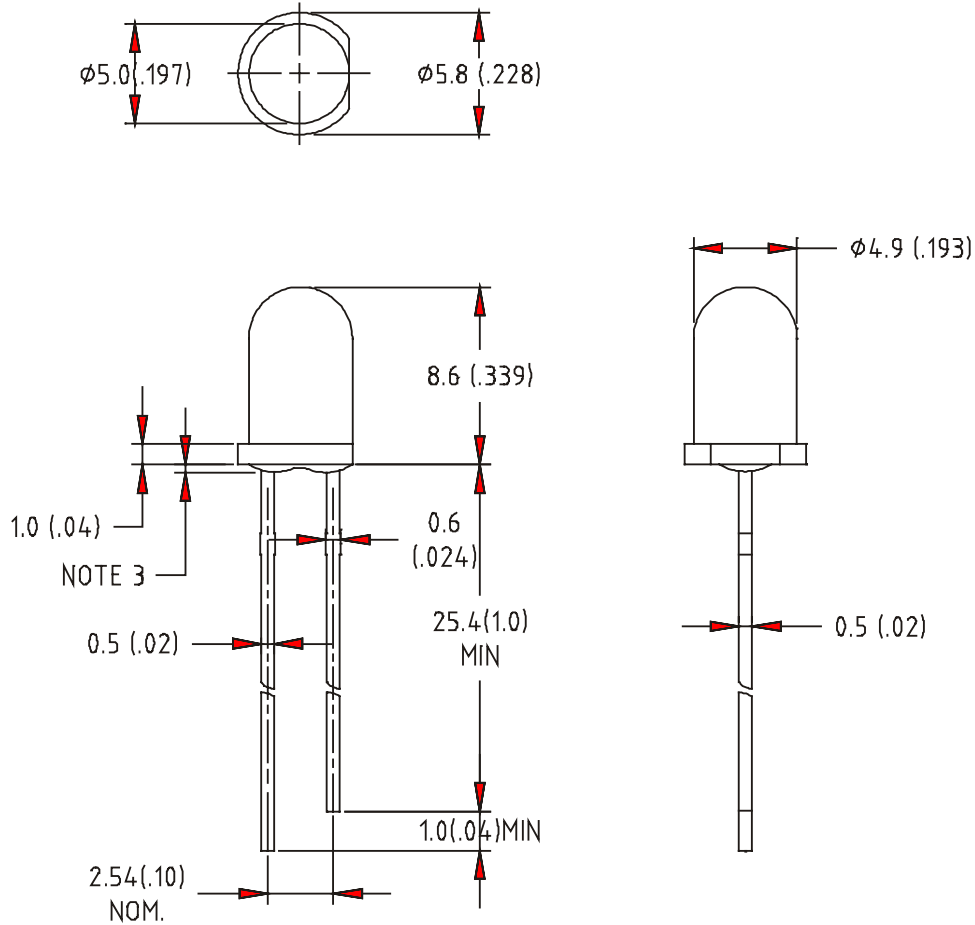
Benefits:

- ◇ New trend creations
- ◇ Low energy consumptions
- ◇ Low maintenance costs
- ◇ High application design flexibility
- ◇ High reliability

Applications

- ◇ Toys / sports utilities
- ◇ Miniature key chains
- ◇ Effect Lights.
- ◇ Display / decoration lights .
- ◇ Electronic displays and signals
- ◇ Interior decoration lights.
- ◇ Indicator lights.
- ◇ Solar energy lights / garden lights

Package Dimension:



| Part No. | Material | Lens Color | Source Color |
|-----------------|----------|-------------|--------------|
| LL-F506RGC2E-F1 | AlGaInP | Water Clear | Hyper Red |
| | InGaN | | Pure Green |
| | InGaN | | Blue |

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25 (.010)$ mm unless otherwise noted.
3. Protruded resin under flange is 1.0mm(.04") max
4. Specifications are subject to change without notice.

Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Max | Unit |
|--|--------|---------------------|------|
| Power Dissipation | PD | 100 | mW |
| Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width) | IFP | 100 | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temperature Range | Topr | -40°C to +85°C | |
| Storage Temperature Range | Tstg | -40°C to +100°C | |
| Lead Soldering Temperature [4mm(.157") From Body] | Tsld | 260°C for 5 Seconds | |

Electrical Optical Characteristics at Ta=25°C

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---------------------------------|-----------------|------------|-------|------|------|----------------|
| Viewing angle | $2\theta_{1/2}$ | --- | 30 | --- | Deg | V=4.5V |
| Operating Voltage | Vdd | --- | 3.0 | 15 | V | |
| Turn on time | Duty | --- | 1/20 | --- | ms | |
| Blinking Frequency | Fled | --- | 0.25 | --- | Hz | V=4.5V |
| Frequency tolerance | Fled | --- | ±20 % | --- | Hz | V=4.5V |
| Dominant Wavelength | λ_d | Hyper Red | 625 | --- | nm | V=4.5V |
| | | Pure Green | 525 | | nm | |
| | | Blue | 470 | | nm | |
| Luminous Intensity (Note 1)* | IV | Hyper Red | 1000 | --- | mcd | V=4.5V |
| | | Pure Green | 2000 | --- | mcd | |
| | | Blue | 1000 | --- | mcd | |

Notes:

1. Luminous Intensity Measurement allowance is $\pm 10\%$
2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity

Reliability

1) Test Items and Results

| Test Item | Standard Test Method | Test Conditions | Note | Number of Damaged |
|---|--------------------------|---|----------------------|-------------------|
| Resistance to Soldering Heat | JEITA ED-4701 300 302 | Tsld=260±5°C, 10sec 3mm from the base of the epoxy bulb | 1 time | 0/100 |
| Solderability | JEITA ED-4701 300 303 | Tsld=235±5°C, 5sec(using flux) | 1time over 95% | 0/100 |
| Thermal Shock | JEITA ED-4701 300 307 | 0°C~100°C 15sec, 15sec | 100 cycles | 0/100 |
| Temperature Cycle | JEITA ED-4701 100 105 | -40°C~25°C~100°C~25°C 30min, 5min, 30min, 5min | 100 cycles | 0/100 |
| Moisture Resistance Cycle | JEITA ED-4701 200 203 | 25°C~65°C~10°C 90%RH 24hrs/1cycle | 10 cycles | 0/100 |
| High Temperature Storage | JEITA ED-4701 200 201 | Ta=100°C | 1000hrs | 0/100 |
| Terminal Strength (Pull test) | JEITA ED-4701 400 401 | Load 10N (1kgf) 10±1sec | Nonnoticeable damage | 0/100 |
| Terminal Strength (bending test) | JEITA ED-4701 400 401 | Load 5N (0.5kgf) 0° ~90° ~0° bend 2 times | Nonnoticeable damage | 0/100 |
| Temperature Humidity Storage | JEITA ED-4701 100 103 | Ta=60°C, RH=90% | 1000hrs | 0/100 |
| Low Temperature Storage | JEITA ED-4701 200 202 | Ta=-40°C | 1000hrs | 0/100 |
| Steady State Operating Life | | Ta=25°C, IF=30mA | 1000hrs | 0/100 |
| Steady State Operating Life of High Humidity Heat | | Ta=60°C, RH=90%, IF=30mA | 500hrs | 0/100 |
| Steady State Operating Life of Low Temperature | | Ta=-30°C, IF=20mA | 1000hrs | 0/100 |

2) Criteria For Judging The Damage

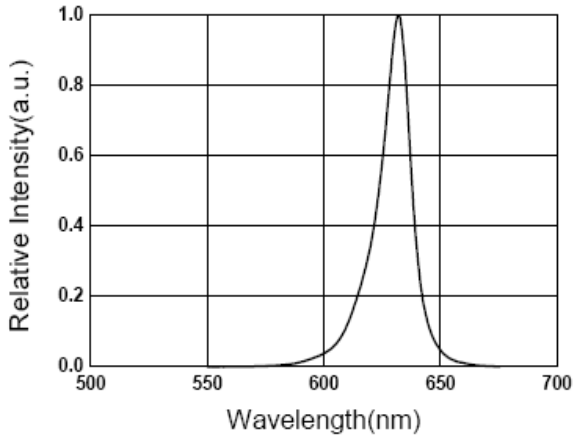
| Item | Symbol | Test Conditions | Criteria for Judgement | |
|--------------------|--------|-----------------|------------------------|------------|
| | | | Min | Max |
| Forward Voltage | VF | IF=20mA | — | F.V.*)×1.1 |
| Reverse Current | IR | VR=5V | — | F.V.*)×2.0 |
| Luminous Intensity | IV |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

*)F.V.:First Value

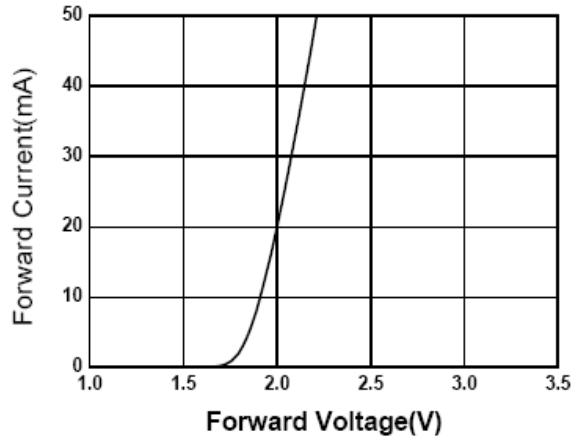
■ Hyper Red

Typical Electro-Optical Characteristics Curves

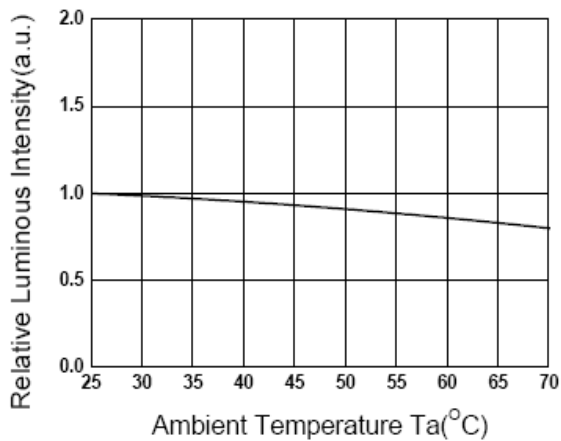
Relative Intensity vs. Wavelength



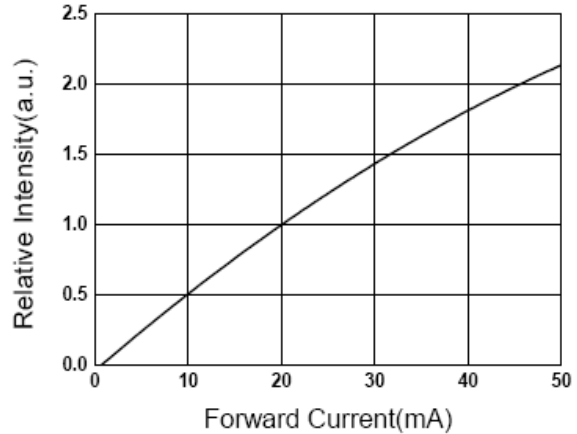
Forward Current vs. Forward Voltage



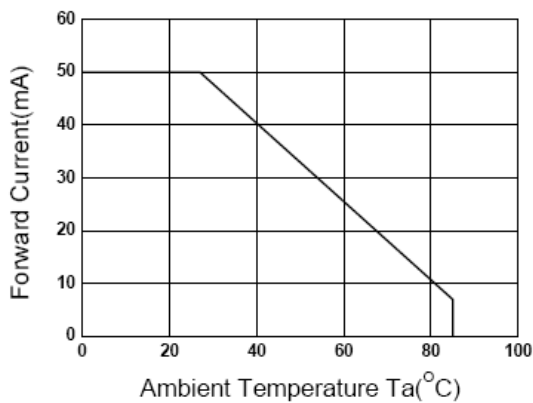
Relative Intensity vs. Ambient Temp



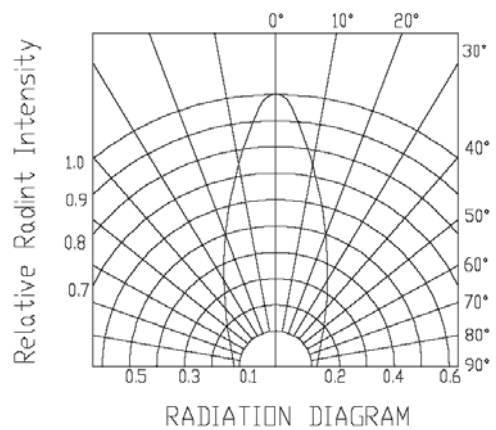
Forward Current vs. Relative Intensity



Forward Current vs. Ambient Temp.



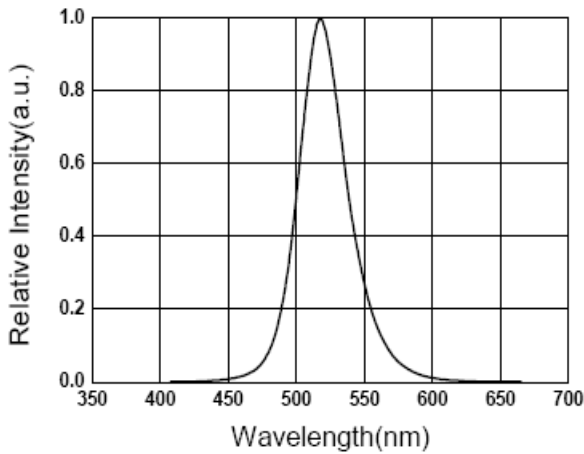
Radiation Diagram Ta=25°C



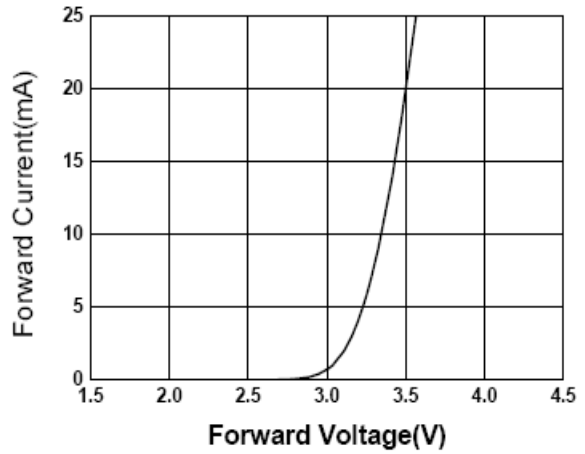
■ Pure Green

**Typical Electrical / Optical Characteristics Curves
(25°C Ambient Temperature Unless Otherwise Noted)**

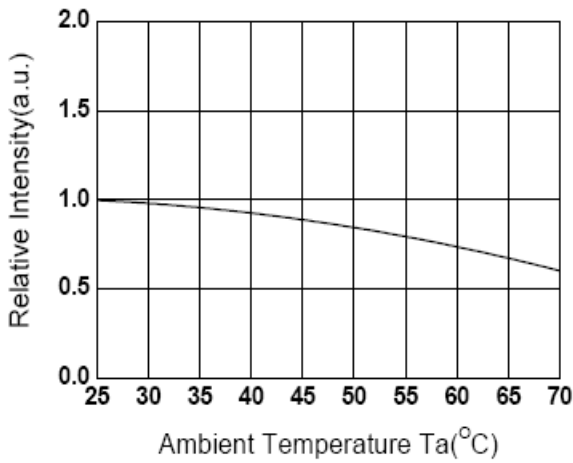
Relative Intensity vs. Wavelength



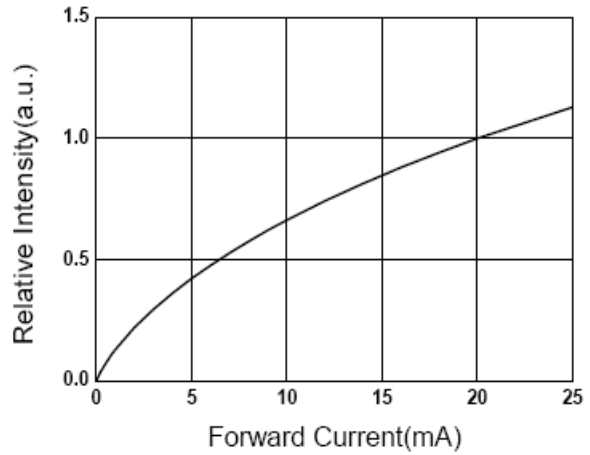
Forward Current vs. Forward Voltage



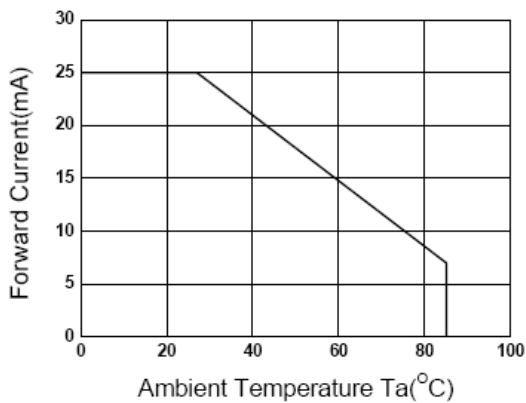
Relative Intensity vs. Ambient Temp



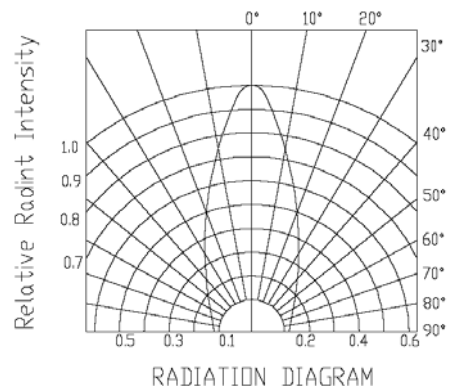
Forward Current vs. Relative Intensity



Forward Current vs. Ambient Temp.



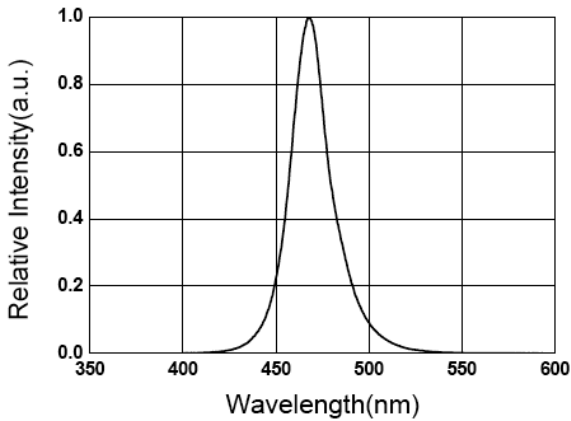
Radiation Diagram Ta=25°C



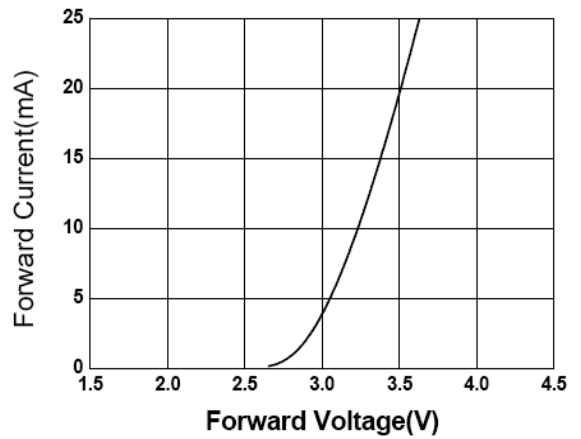
Blue

**Typical Electrical / Optical Characteristics Curves
(25°C Ambient Temperature Unless Otherwise Noted)**

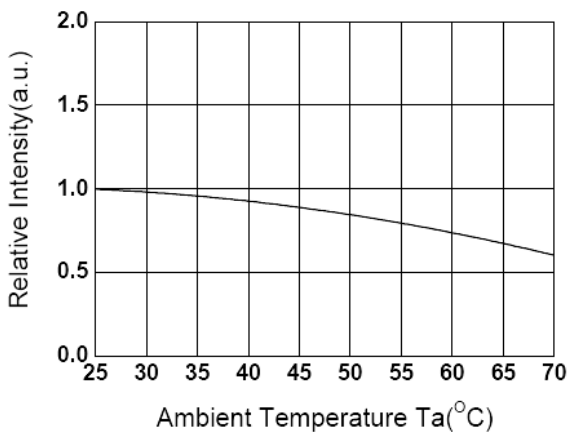
Relative Intensity vs. Wavelength



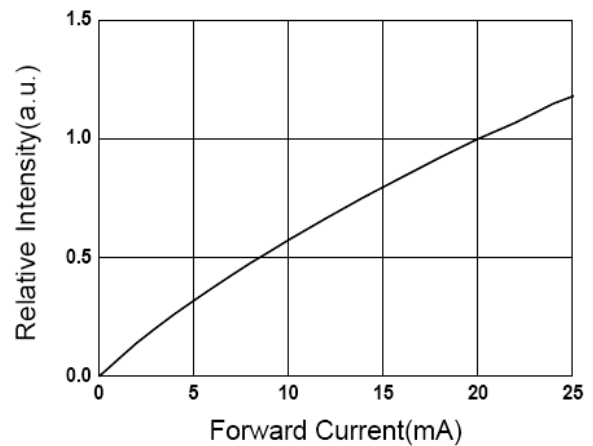
Forward Current vs. Forward Voltage



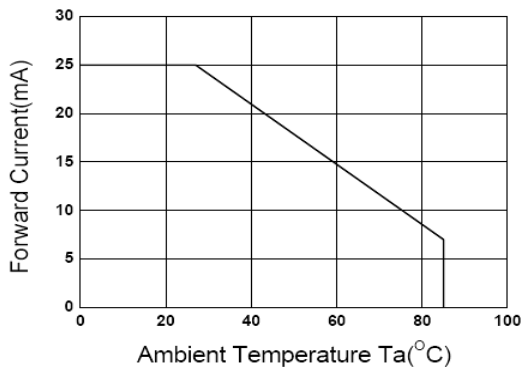
Relative Intensity vs. Ambient Temp



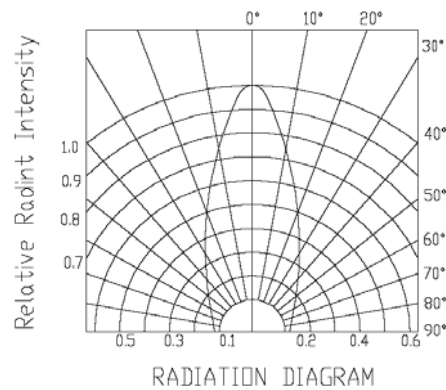
Forward Current vs. Relative Intensity



Forward Current vs. Ambient Temp.



Radiation Diagram Ta=25°C



Examples of color shifting sections (control mechanisms) at $V_F = 4.5V \pm 0.2V$

| F1: 7 Color On & Off (4 sec) | | |
|------------------------------|---|---|
| R | G | B |
| ◇ | × | × |
| × | ◇ | × |
| × | × | ◇ |
| ◇ | ◇ | × |
| × | ◇ | ◇ |
| ◇ | × | ◇ |
| ◇ | ◇ | ◇ |

Notes:

1. ◇ = Slow fade , Light On then Off.
2. × = Light Off.

Please read the following notes before using the datasheets

1. Over-current-proof

Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the LEDs should be kept at 30°C or less and 90%RH or less.

2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

3. Soldering Condition

3.1 Pb-free solder temperature profile

3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering

of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

6. Caution in ESD

Static Electricity and surge damages the LED. It is recommend to use a wrist band or anti-electrostatic glove when handling the LED. All devices equipment and machinery must be properly grounded.