



## QUALITY CONTROL AND ASSURANCE

| Classification     | Test Item                              | Reference Standard  | Test Conditions   | Result |
|--------------------|--|---|---|--------|
| Endurance Test     | Operation Life                         | MIL-STD-750:1026<br>MIL-STD-883:1005<br>JIS C 7021 :B-1                     | Connect with a power $I_f=20\text{mA}$<br>$T_a$ =Under room temperature<br>Test time=1,000hrs   | 0/20   |
|                    | High Temperature High Humidity Storage | MIL-STD-202:103B<br>JIS C 7021 :B-11  | $T_a=+65^\circ\text{C} \pm 5^\circ\text{C}$<br>RH=90%-95%<br>Test time=1,000hrs   | 0/20   |
|                    | High Temperature Storage               | MIL-STD-883:1008<br>JIS C 7021 :B-10  | High $T_a=+85^\circ\text{C} \pm 5^\circ\text{C}$<br>Test time=1,000hrs  | 0/20   |
|                    | Low Temperature Storage                | JIS-C-7021 :B-12  | Low $T_a=-35^\circ\text{C} \pm 5^\circ\text{C}$<br>Test time=1,000hrs   | 0/20   |
| Environmental Test | Temperature Cycling                    | MIL-STD-202:107D<br>MIL-STD-750:1051<br>MIL-STD-883:1010<br>JIS C 7021 :A-4 | $-35^\circ\text{C} \sim +25^\circ\text{C} \sim +85^\circ\text{C} \sim +25^\circ\text{C}$<br>60min 20min 60min 20min<br>Test Time=5cycle | 0/20   |
|                    | Thermal Shock                          | MIL-STD-202:107D<br>MIL-STD-750:1051<br>MIL-STD-883:1011                    | $+85^\circ\text{C} \pm 5^\circ\text{C} \sim -35^\circ\text{C} \pm 5^\circ\text{C}$<br>20min 20min<br>Test Time=10cycle                  | 0/20   |
|                    | Solder Resistance                      | MIL-STD-202:201A<br>MIL-STD-750:2031<br>JIS C 7021 :A-1                     | Preheating :<br>140°C-160°C, within 2 minutes.<br>Operation heating :<br>235°C (Max.), within 10seconds. (Max.)                         | 0/20   |

### JUDGMENT CRITERIA OF FAILURE FOR THE RELIABILITY

| Measuring items    | Symbol        | Measuring conditions | Judgement criteria for failure |
|--------------------|---------------|----------------------|--------------------------------|
| Forward voltage    | $V_F$ ( V )   | $I_f=20\text{mA}$    | Over U x 1.2                   |
| Reverse current    | $I_r$ (uA)    | $V_r=5\text{V}$      | Over U x 2                     |
| Luminous intensity | $I_v$ ( mcd ) | $I_f=20\text{mA}$    | Below S x 0.5                  |

Note:

1. U means the upper limit of specified characteristics. S means initial value.
2. Measurement shall be taken between 2 hours and after the tested parts have been returned to normal ambient conditions after completion of each test.



## PRECAUTIONS FOR USING BRIGHT CHIP LED PRODUCTS

### 1. Soldering :

Manual Of Soldering

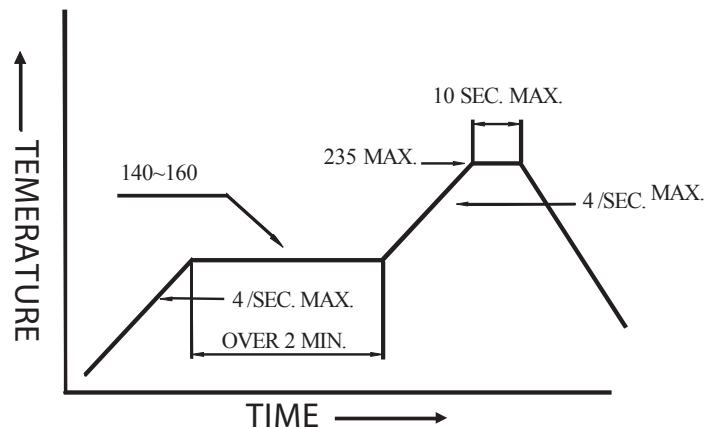
The temperature of the iron tip should not be higher than 300 °C (572 °F) and Soldering within 3 seconds per solder-land is to be observed.

Reflow Soldering

Preheating : 140 °C ~ 160 °C ± 5 °C, within 2 minutes.

Operation heating : 235 °C (Max) within 10 seconds (Max.)

Gradual Cooling (Avoid quenching.)

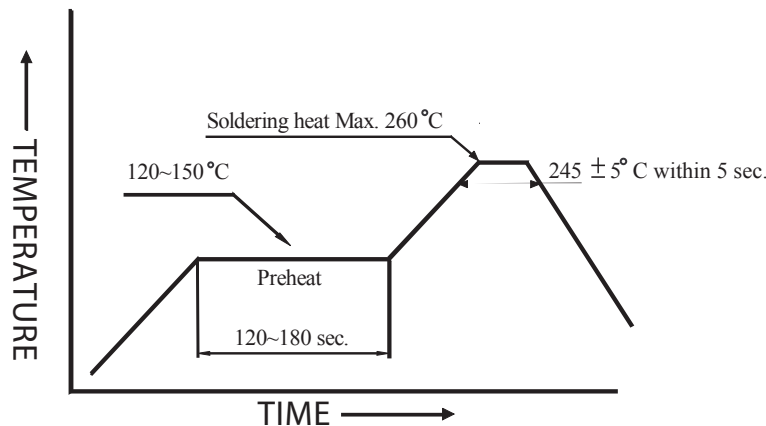


DIP Soldering (Wave Soldering)

Preheating : 120 °C ~ 150 °C, within 120 ~ 180 seconds.

Operation heating : 245 °C ± 5 °C, within 5 seconds, 260 °C (Max.)

Gradual Cooling (Avoid quenching.)



### 2. Handling :

Care must be taken not to cause to the epoxy resin portion of LEDs while it is exposed to high temperature.

Care must be taken not to rub the epoxy resin portion of LEDs with hard or sharp article such as the sand blast and the metal hook.



## PRECAUTIONS FOR USING BRIGHT CHIP LED PRODUCTS

### 3. Notes for designing :

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload the LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive, care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as to be subjected to reverse voltage when turning off the LEDs.

### 4. Storage :

In order to avoid the absorption of moisture, it is recommended to solder the LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, please store it in the environment as following:

(1) Temperature : 5 °C - 30 °C (41 °F) Humidity : RH 60% Max.

(2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow or equivalent soldering process must be:

- a. Completed within 24 hours.
- b. Stored at less than 30% RH.

(3) Devices require baking before mounting if:

- (2) a or (2) b is not met.

(4) If baking is required, devices must be baked under the following conditions:

12 hours at 60 °C ± 3 °C.



## ABSOLUTE MAXIMUM RATINGS

### 1. Test Condition For Each Parameter :

| Parameter                | Symbol           | Unit    | Test Condition               |
|--------------------------|------------------|---------|------------------------------|
| Reverse Voltage          | $V_R$            | V       | $I_R=100\mu A$               |
| Reverse Current          | $I_R$            | $\mu A$ | $V_R=5V$                     |
| Forward Voltage          | $V_F$            | V       | $I_F=20mA$                   |
| Luminous Intensity       | $I_V$            | mcd     | $I_F=20mA$                   |
| Viewing Angle            | $2\theta_{1/2}$  | Degree  | $I_F=20mA$                   |
| Spectral Line Half-Width | $\Delta \lambda$ | nm      | $I_F=20mA$                   |
| Power Dissipation        | $P_D$            | mw      | $I_F=20mA$                   |
| Peak Forward Current     | $I_{FP}$         | mA      | Duty 1/10, Pulse width=0.1ms |

### 2. Absolute Maximum Ratings :

|                             |                                  |
|-----------------------------|----------------------------------|
| Reverse Voltage             | 5.0 Volt                         |
| Reverse Current( $V_R=5V$ ) | $\leq 100\mu A$                  |
| Operating Temperature Range | $-25^{\circ}C \sim +80^{\circ}C$ |
| Storage Temperature Range   | $-30^{\circ}C \sim +85^{\circ}C$ |

## TYPICAL ELECTRICAL-OPTICAL CHARACTERISTICS CURVES

