





### Electro-Optical characteristics

(T =25℃, RH=30%)

Items	Symbol	Condition	Min.	Typ.	Max	Unit
Forward Current	I <sub>F</sub>	-	-	20	-	mA
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	3.0	-	3.8	V
Optical Power Output	P <sub>o</sub>	I <sub>F</sub> =20mA	3	-	8	mW
Wavelength	λ <sub>p</sub>	I <sub>F</sub> =20mA	365	-	372.5	nm
50% Power Angle	2θ <sub>½</sub>	I <sub>F</sub> =20mA	-	20	-	deg

### Absolute Maximum Ratings at Ta = 25℃

Parameter	Symbol	Absolute maximum Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Reverse Current	I <sub>R</sub>	≤5	μA
Power Dissipation	P <sub>D</sub>	180	mW
Operation Temperature	T <sub>opr</sub>	-40 ~ +60	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
Lead Soldering Temperature(5mm From The Base Of The Epoxy Bulb)	T <sub>sol</sub>	260 (≤3s)	°C

\* Where pulse width ≤ 0.1msec, duty cycle ≤ 1/10

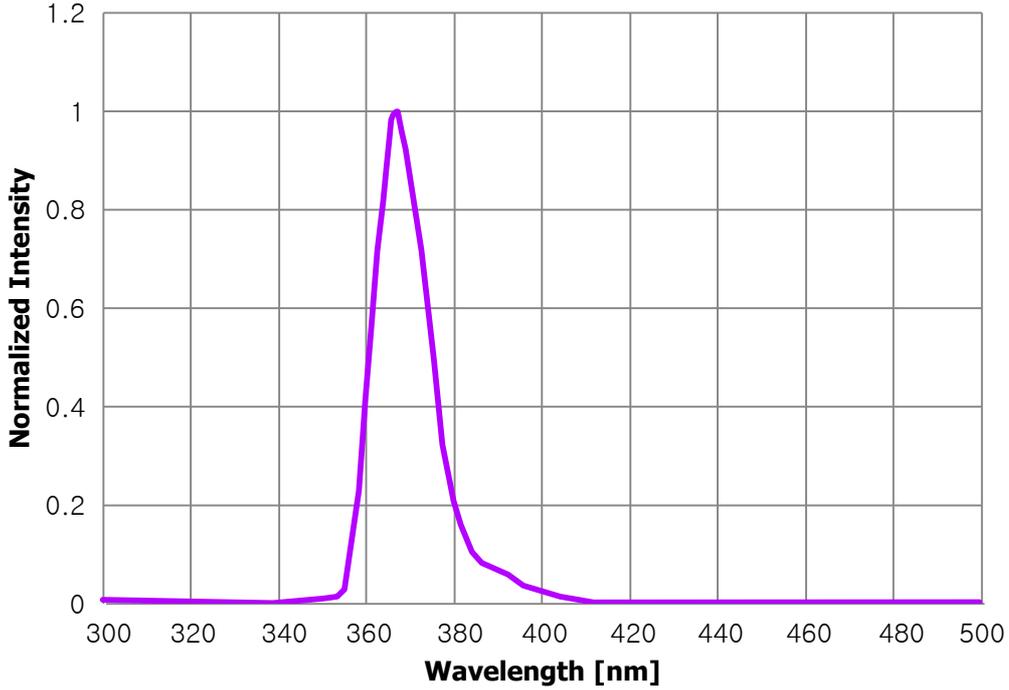
Notes :

1. Peak Wavelength Measurement tolerance : ±3nm
2. Radiant Flux Measurement tolerance : ±10%
3. Φ<sub>e</sub> is the Total Radiant Flux as measured with an integrated sphere.



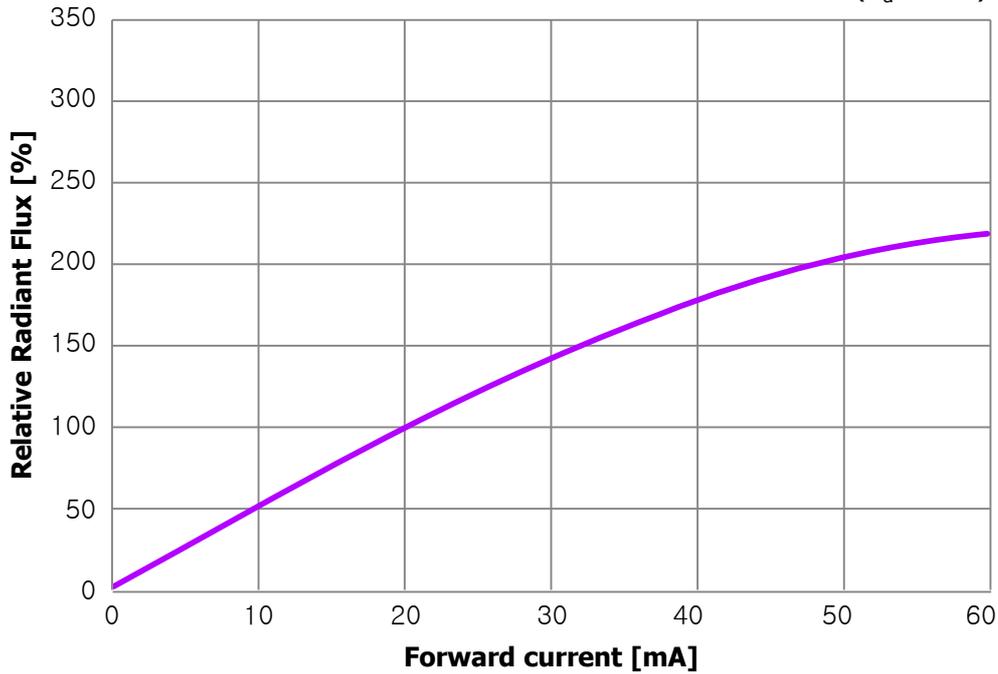
### Spectral Power Distribution

( $I_F=20\text{mA}$ ,  $T_a=25^\circ\text{C}$ ,  $\text{RH}=30\%$ )



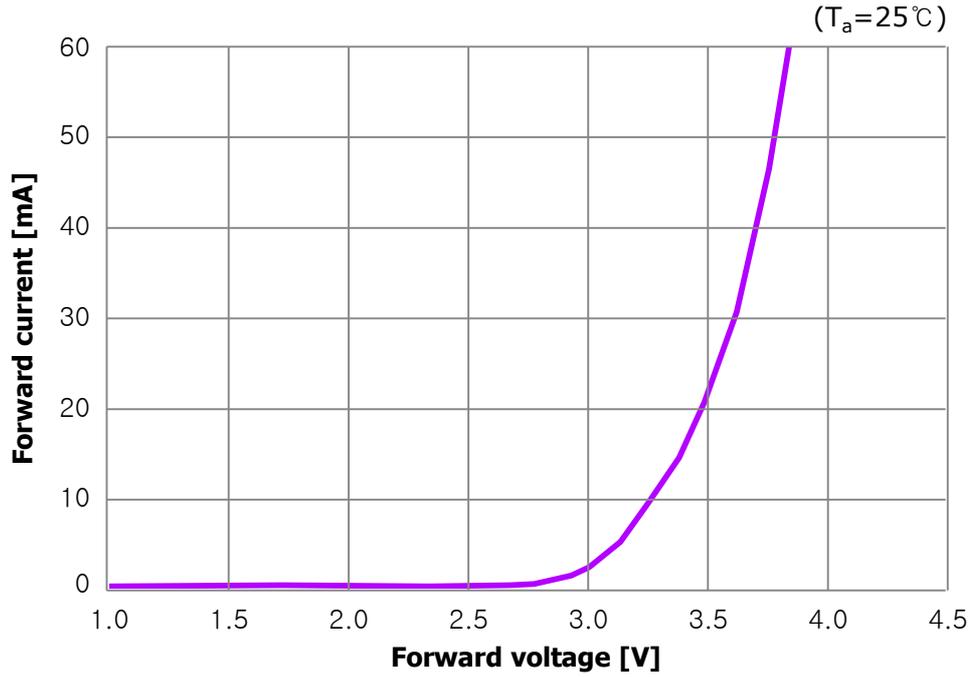
### Relative Radiant Flux vs. Forward Current

( $T_a=25^\circ\text{C}$ )

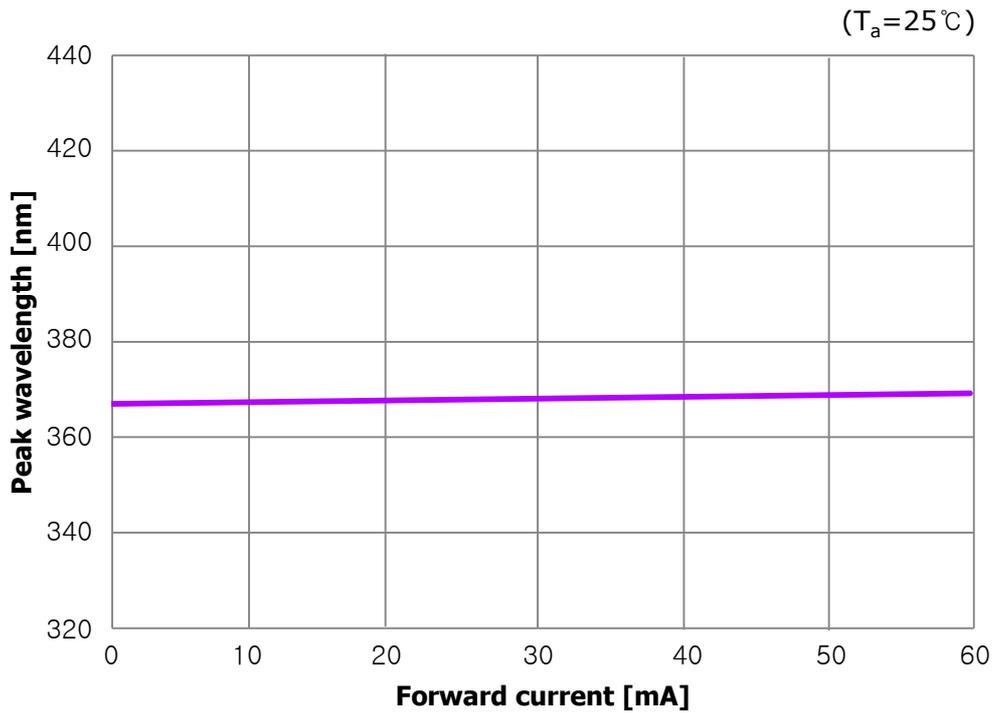




### Forward current vs. Forward Voltage

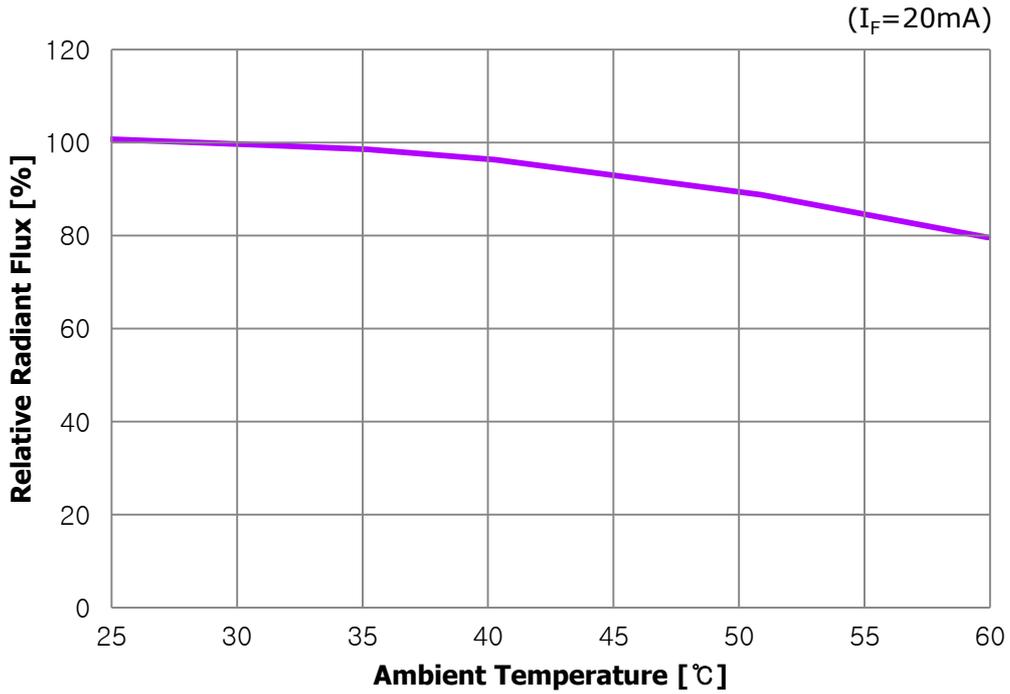


### Peak Wavelength vs. Forward current

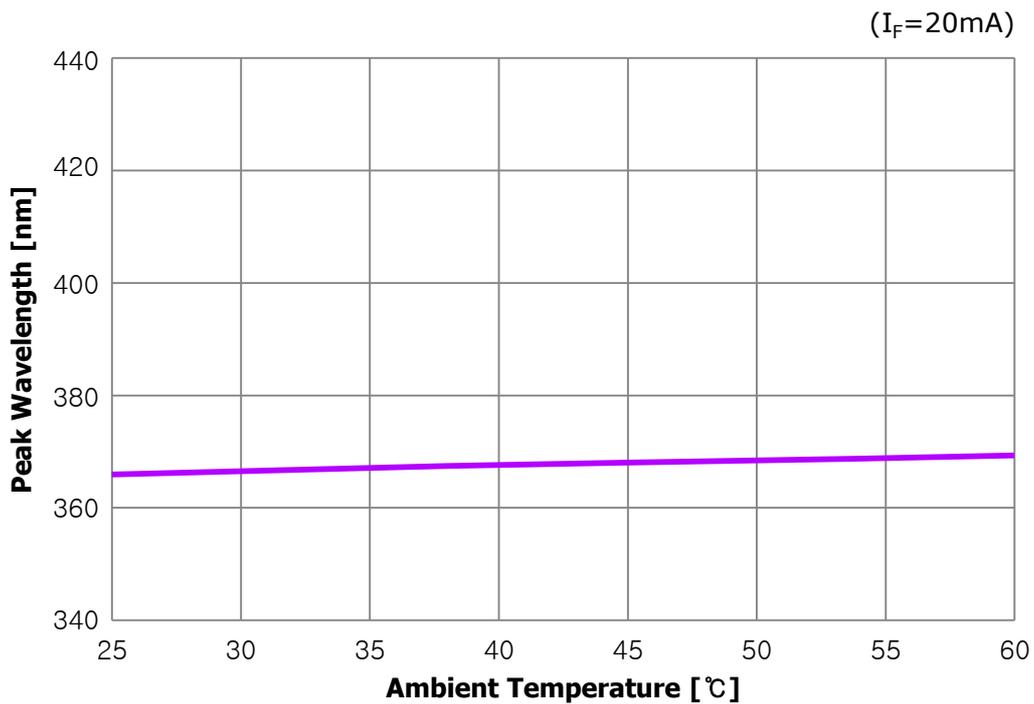




### Relative Radiant Flux vs. Ambient Temperature

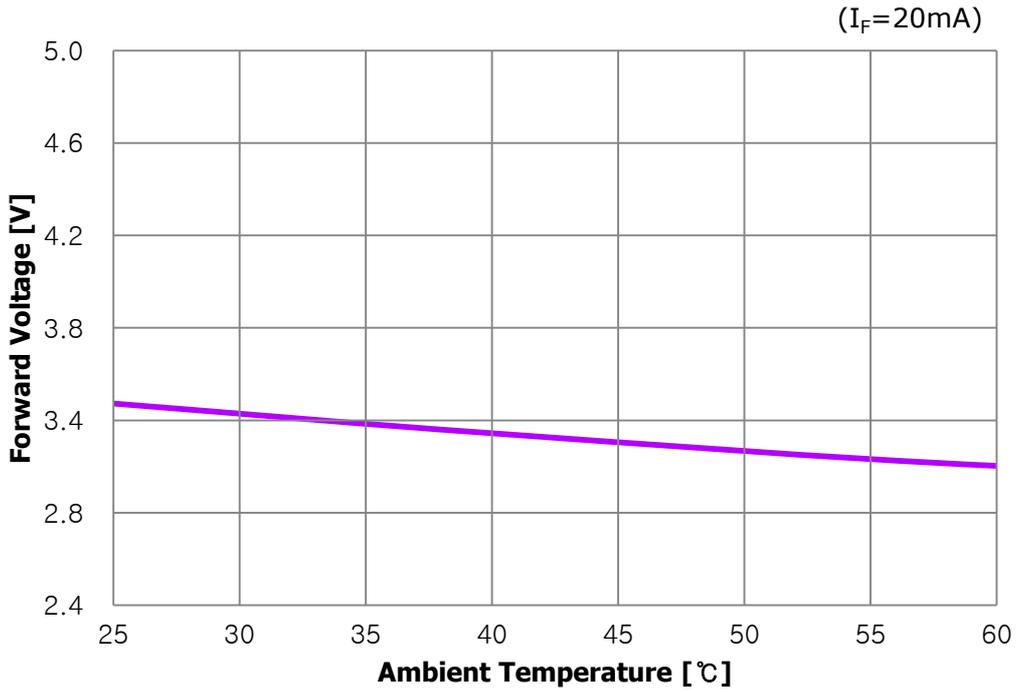


### Peak Wavelength vs. Ambient Temperature

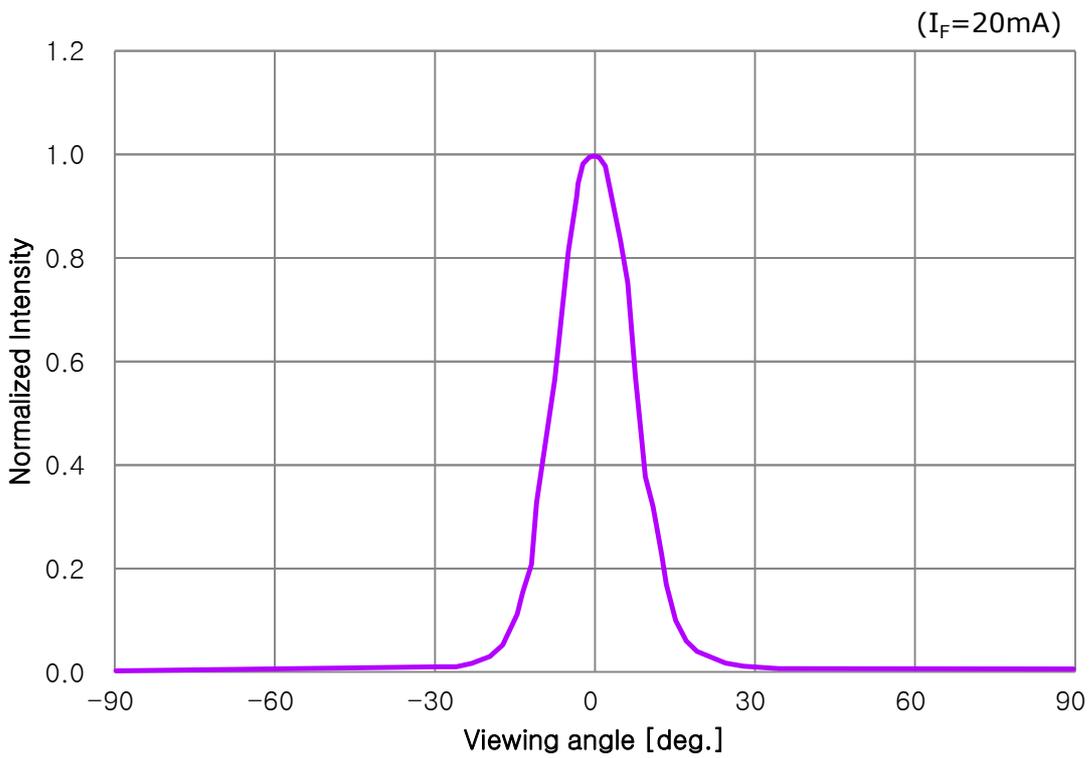




### Forward Voltage vs. Ambient Temperature



### Radiant Pattern





## Precaution for Use

### (1) Cautions

- The devices are UV light LEDs. The LED during operation radiates intense UV light, which precautions must be taken to prevent looking directly at the UV light with unaided eyes. Do not look directly into the UV light or look through the optical system. When there is a possibility to receive the reflection of light, protect by using the UV light protective glasses so that light should not catch one's eye directly.

### (2) Lead Forming

- When forming leads, the leads should be bent at a point at least 3mm from the base of the lead. Do not use the base of the leadframe as a fulcrum during lead forming.
- Lead forming should be done before soldering.
- Do not apply any bending stress to the base of the lead. The stress to the base may damage the LED's characteristics or it may break the LEDs.
- When mounting the LEDs onto a printed circuit board, the holes on the circuit board should be exactly aligned with the leads of the LEDs. If the LEDs are mounted with stress at the leads, it causes deterioration of the lead and this will degrade the LEDs.

### (3) Storage

- The LEDs should be stored at 30°C or less and 70%RH or less after being shipped from Tianhui 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.
- Tianhui LED leadframes are silver plated copper alloy. The silver surface may be affected by environments which contain corrosive substances. Please avoid conditions which may cause the LED 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.

### (4) 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 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 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). The LEDs should be used the light detector etc. when testing the light-on. Do not stare into the LEDs when testing.
- Damaged LEDs will show some unusual characteristics such as the forward voltage becomes lower, or the LEDs do not light at the low current. Criteria : (VF > 2.0V at IF=0.5mA)



## Precaution for Use

### (5) Soldering Conditions

- Tianhui LED leadframes are silver plated copper alloy. This substance has a low thermal coefficient (easily conducts heat). Careful attention should be paid during soldering.
- Solder the LED 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°C Max.	Temperature	350°C Max.
Pre-Heat Time	60 seconds Max.	Soldering Time	3 seconds Max.
Solder Bath	260°C Max.	Position	No closer than 3 mm from the base of the epoxy bulb.
Temperature			
Dipping Time	10 seconds Max.		
Dipping Position	No lower than 3 mm 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 down 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. Tianhui's 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 LED leadframes at room temperature. Cutting the leadframes at high temperatures may cause failure of the LEDs.

### (6) Heat Generation

- Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED 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 LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.
- The operating current should be decided after considering the ambient maximum temperature of LEDs.



## Precaution for Use

### (7) Cleaning

- It is recommended that isopropyl alcohol be used as a solvent for cleaning the 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.

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 the LEDs will occur.

