Deep UV LED - 275nm

3030 series (CUD7QF1A)

CUD7QF1A

RoHS

Product Brief

Description

- CUD7QF1A is a deep ultraviolet light emitting diode with peak emission wavelengths from 270nm to 280nm.
- The LED is sealed in EMC packages with a silicone mold.

Features and Benefits

- Deep ultraviolet LED
- SMT solderable
- Lead Free product
- RoHS compliant

Key Applications

- Chemical and Biological analysis

Performance Characteristics

Table 1. Electro-Optical characteristics at 20mA

(T_a=25℃, RH=30%)

Parameter	Symbol	Value	Unit
Peak wavelength [1]	λp	275	nm
Radiant Flux[2]	Φe[3]	1.9	mW
Forward Voltage [4]	VF	6	V
Spectrum Half Width	Δ λ	11	nm
View Angle	2Θ1/2	125	deg.

Table 2. Absolute Maximum Rating

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Forward Current	I_F	-	-	30	mA
Power Dissipation	P_D	-	-	220	mW
Operating Temperature	T_{opr}	- 30	-	60	ºC
Storage Temperature	T_{stg}	- 40	-	100	ºC
Thermal resistance (J to S) [5]	$R\theta_{J-S}$	-	44.7	-	ºC/W

Notes :
1. Peak Wavelength Measurement tolerance : ±3nm
2. Radiant Flux Measurement tolerance : ± 10%
3. Φ_e is the Total Radiant Flux as measured with an integrated sphere.
4. Forward Voltage Measurement tolerance : ±3%

Binning Structure

Table 3. Binning Structure , I_F=20mA

Main Ranks

Y_1Y_2			$Y_3Y_4Y_5$			Y_6		
Wp [nm]			Radiant Flux [mW]			Vf [V]		
BIN	MIN	MAX	BIN	MIN	MAX	BIN	MIN	MAX
c2	265	275	Z12	1.2	1.5	a	5.0	5.2
c3	275	285	Z15	1.5	1.8	b	5.2	5.4
			Z18	1.8	2.3	c	5.4	5.6
			Z23	2.3	3.0	d	5.6	5.8
						e	5.8	6.0
						f	6.0	6.2
						g	6.2	6.4
						h	6.4	6.6
						i	6.6	6.8
						j	6.8	7.0

Table 4. Ranks :

Binning Code	Description	Unit
Y_1Y_2	Peak Wavelength	nm
$Y_3Y_4Y_5$	Radiant Flux	mW
Y_6	Forward Voltage	V

Notes :

1. Peak Wavelength Measurement tolerance : ±3nm
2. Radiant Flux Measurement tolerance : ± 10%
3. Forward Voltage Measurement tolerance : ±3%

Characteristics Graph

Fig 1. Spectrum, Ta=25℃, I_F=20mA

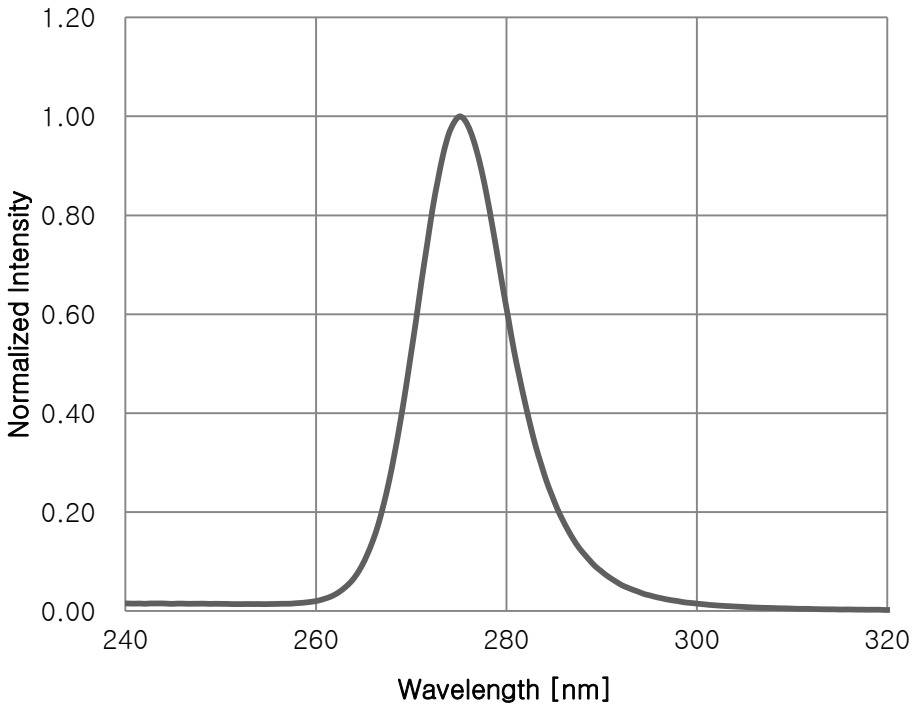
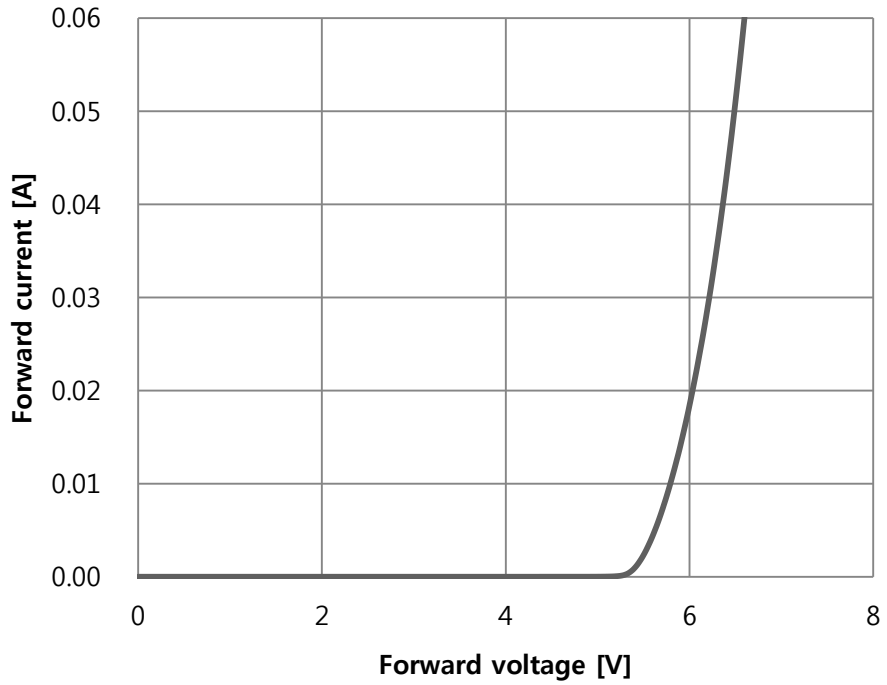


Fig 2. Forward Voltage vs. Forward Current, T_a=25℃



Characteristics Graph

Fig 3. Forward Current vs. Relative Radiant Flux, T_a=25℃

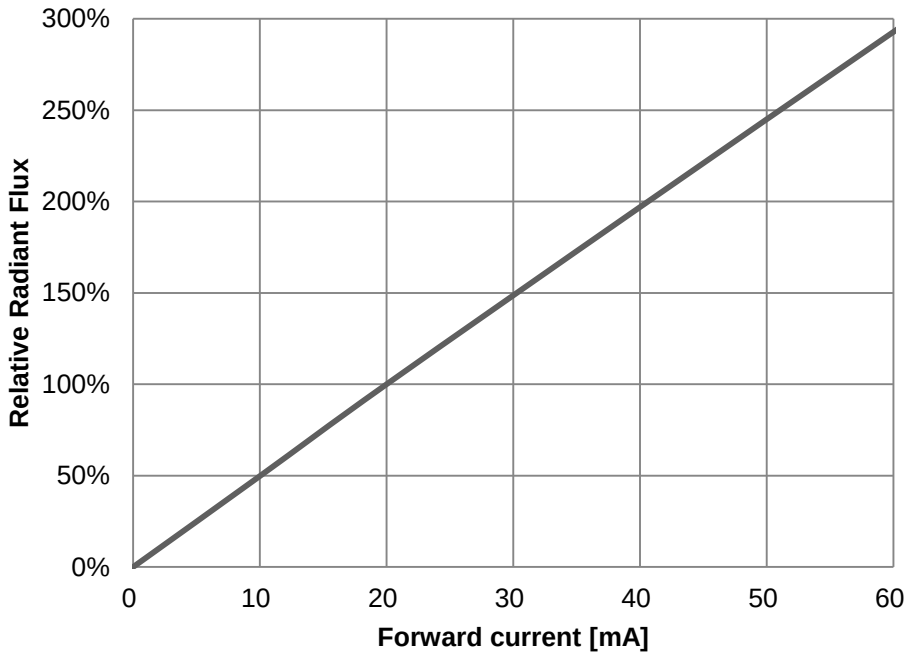
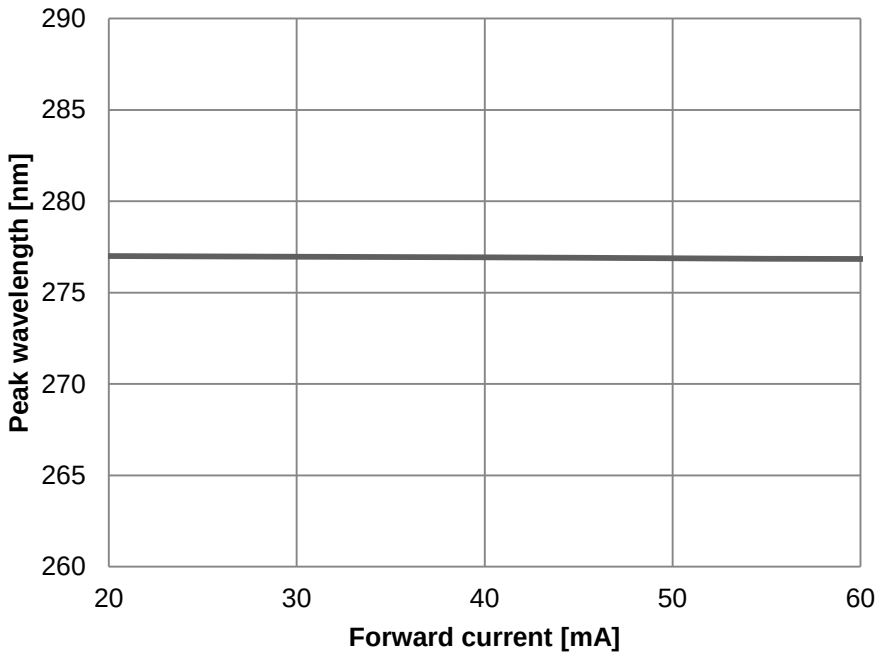


Fig 4. Forward Current vs. Peak Wavelength, T_a=25℃



Characteristics Graph

Fig 5. Ambient Temperature vs. Relative Radiant Flux, I_F=20mA

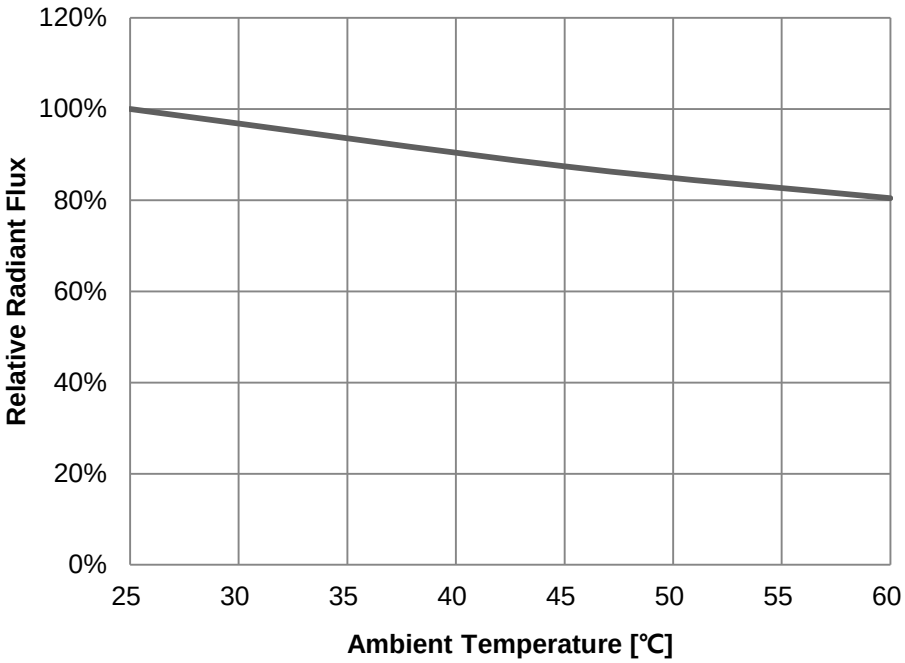
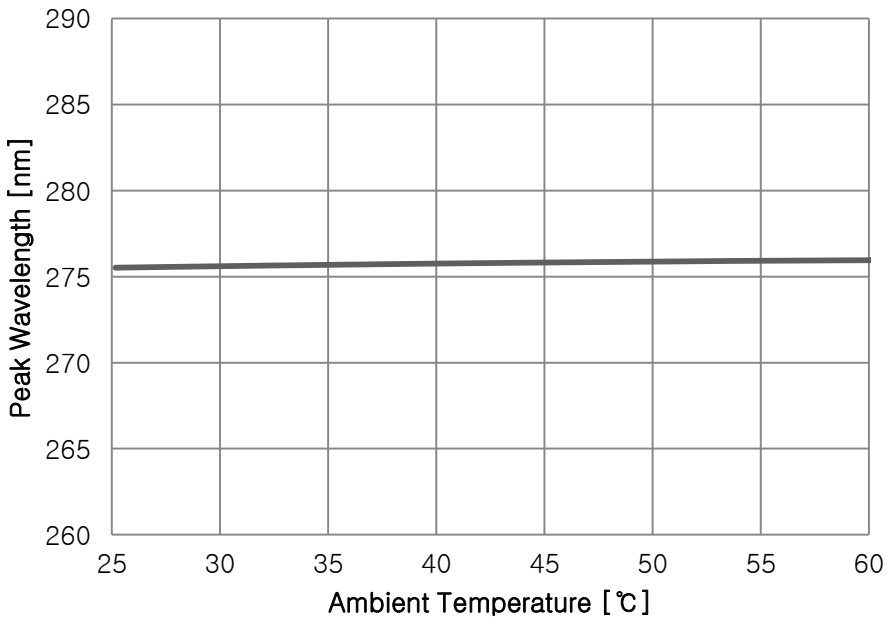


Fig 6. Ambient Temperature vs. Peak Wavelength, I_F=20mA



Characteristics Graph

Fig 7. Ambient Temperature vs. Forward Voltage, I_F=20mA

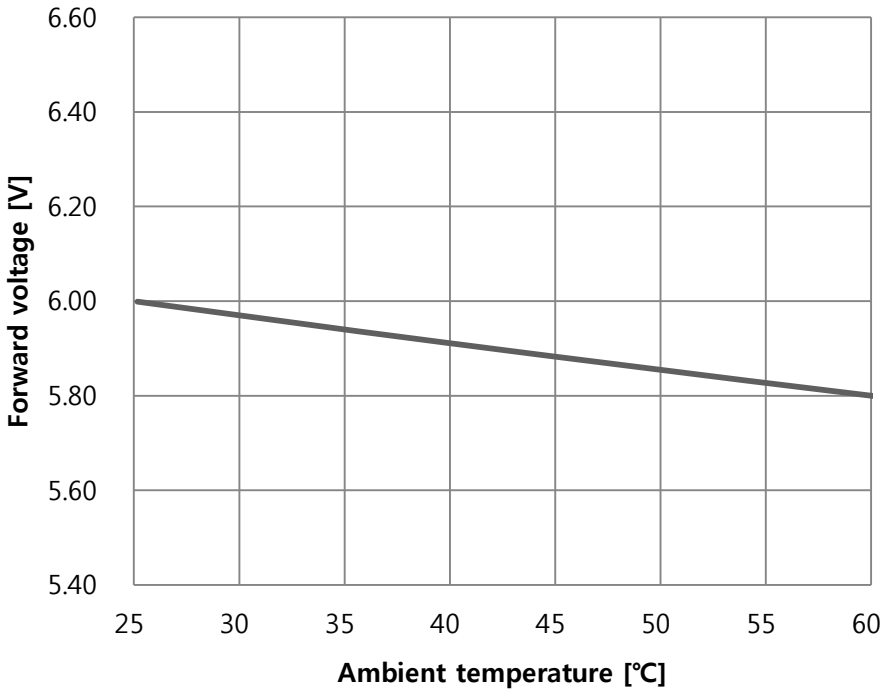
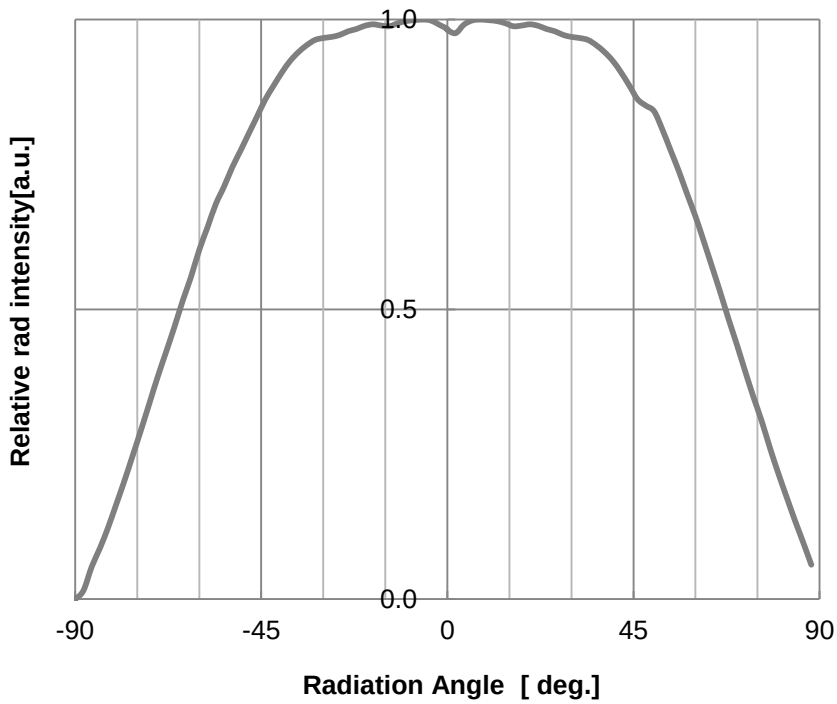
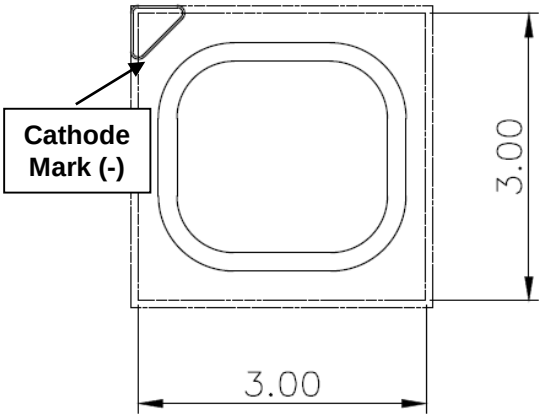


Fig 8. Typical Spatial Distribution, I_F=20mA

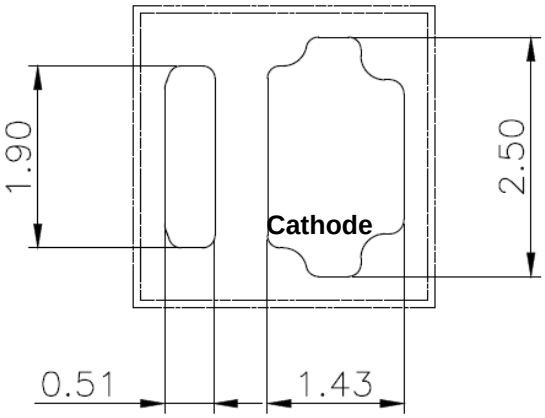


Mechanical Dimensions

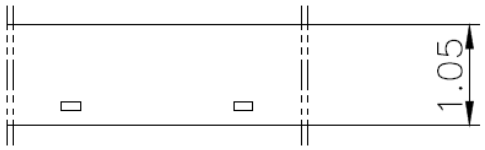
Top View



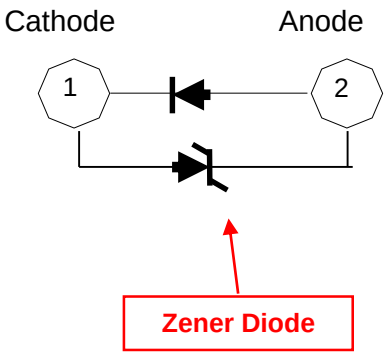
Bottom View



Side View

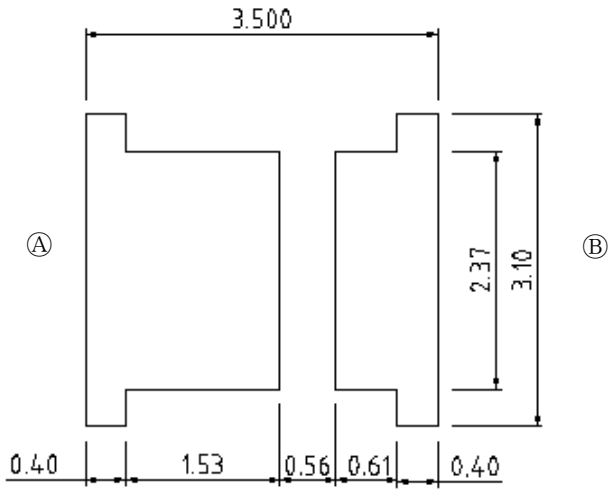


Circuit



Notes :
[1] All dimensions are in millimeters.
[2] Scale : none

Recommended Solder Pad



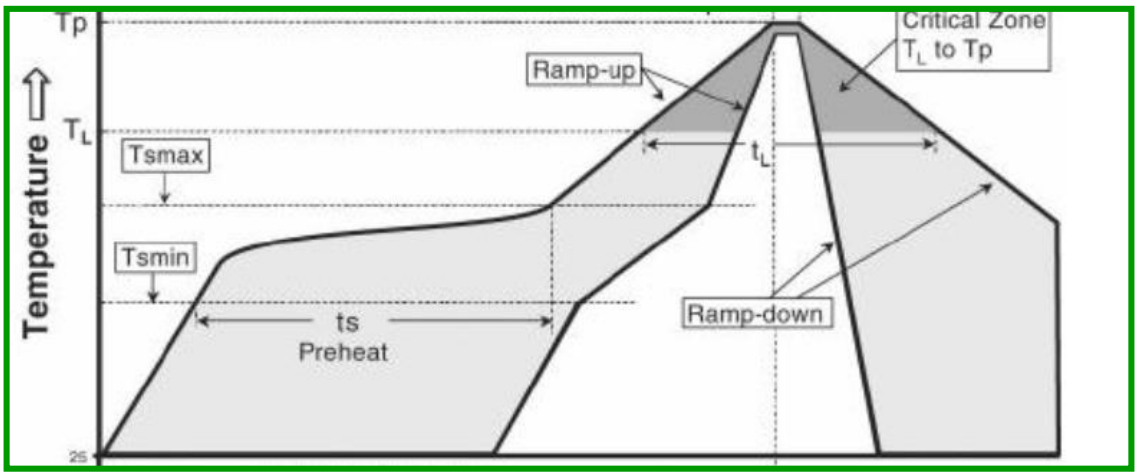
Ⓐ : Cathode
Ⓑ : Anode

Recommended PCB Solder Pad

Notes :

[1] All dimensions are in millimeters.
[2] Scale : none
[3] This drawing without tolerances is for reference only

Reflow Soldering Characteristics



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (Ts_max to Tp)	3° C/second max.	3° C/second max.
Preheat - Temperature Min (Ts_min) - Temperature Max (Ts_max) - Time (Ts_min to Ts_max) (ts)	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-180 seconds
Time maintained above: - Temperature (TL) - Time (tL)	 183 °C 60-150 seconds	 217 °C 60-150 seconds
Peak Temperature (Tp)	215℃	260℃
Time within 5°C of actual Peak Temperature (t)2	10-30 seconds	20-40 seconds
Ramp-down Rate	6 °C/second max.	6 °C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

* Caution
1. Reflow soldering should not be done more than one time.
2. Repairs should not be done after the LEDs have been soldered.
   When repair is unavoidable, suitable tools must be used.
3. Die slug is to be soldered.
4. When soldering, do not put stress on the LEDs during heating.
5. After soldering, do not warp the circuit board.
6. Recommend to use a convection type reflow machine with 7 ~ 8 zones.

Precaution for Use

1) Storage

- To avoid moisture penetration, we recommend storing UV LEDs in a dry box with a desiccant. The recommended temperature and Relative humidity are between 5℃ and 30℃ and below 50% respectively.
- LEDs must be stored properly to maintain the device. If the LEDs are stored for 3 months or more after being shipped from SVC, a sealed container with a nitrogen atmosphere should be used for storage.
- Replace the remained LEDs into the moisture-proof bag and reseal the bag after work to avoid those LEDs being exposed to moisture. Prolonged exposure to moisture can adversely affect the proper functioning of the LEDs.
- The conditions of resealing are as follows: temperature is 5 to 40℃ and Relative humidity is less than 30%

2) Handling Precautions

- VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can discolor them when exposed to heat and photonic energy.
- In case of attaching LEDs, do not use adhesives that outgas organic vapor.
- Soldering should be done as soon as possible after opening the moisture-proof bag.
- Do not rapidly cool device after soldering.
- Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering.
- Components should not be mounted on warped (non coplanar) portion of PCB.
- Avoid touching the chips and the wire bonded parts.

3) Safety for eyes and skin

- The Products emit high intensity ultraviolet light which can make your eyes and skin harmful, So do not look directly into the UV light and wear protective equipment during operation.

4) Cleaning

- This device is not allowed to be used in any type of fluid such as water, oil, solvent , etc.

5) Others

- The appearance and specifications of the product may be modified for improvement without notice.
- When the LEDs are in operation the maximum current should be decided after measuring the package temperature.
- The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the reverse voltage is applied to LED, migration can be generated resulting in LED damage.
- Do not handle this product with acid or sulfur material in sealed space.