

Specification

STU7T16C (CUN0CF1)

SVC		Customer
Drawn	Approval	Approval

[Contents]

- 1. Description**
- 2. Outline dimensions**
- 3. Characteristics of CUN0CF1**
- 4. Characteristic diagrams**
- 5. Binning & Labeling**
- 6. Reel packing**
- 7. Recommended solder pad**
- 8. Reflow Soldering profile**
- 9. Reliability**
- 10. Precaution for use**
- 11. Revision history**

STU7T16C(CUN0CF1)

Description

Low power UV LED series are designed for low current operation and low power output application.

This surface-mount UV LED comes in standard package dimension and is effective in the curing application.



STU7T16C(CUN0CF1)

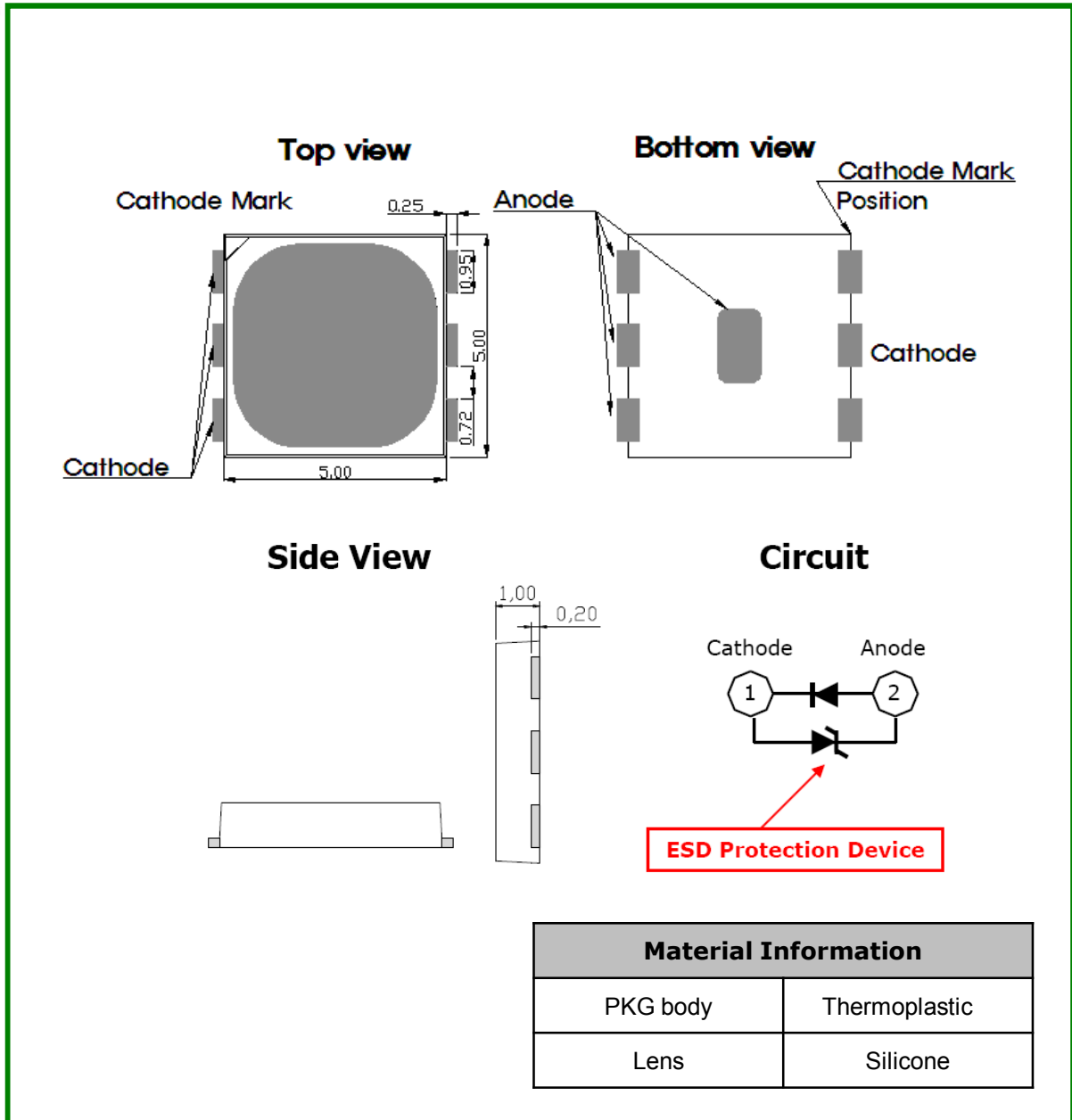
Features

- Standard package dimension
- UV SMT package.
- Pb-free Reflow Soldering
- Application.
- Suitable for all SMT assembly methods ;
- Suitable for all soldering methods.

Applications

- UV Curing
- Printing
- Coating
- Adhesive
- Counterfeit Detection/ Security
- UV Torch
- Fluorescence Photography
- Dental Curing
- Crime Inspection
- Oil leak Detection

Outline dimensions



Notes :

1. All dimensions are in millimeters.
2. Scale : none
3. Undefined tolerance is $\pm 0.2\text{mm}$

Characteristics of STU7T16C(CUN0CF1)

1. Electro-Optical characteristics at 50mA

(T_a=25°C, RH=30%)

Parameter	Symbol	Value	Unit
Peak wavelength ^[1]	λ_p	400	nm
Radiant Flux @ 50mA ^[2]	Φ_e ^[3]	61	mW
Forward Voltage ^[4]	V _F	3.2	V
Spectrum Half Width	$\Delta \lambda$	12	nm
View Angle	2 $\theta_{1/2}$	120	deg.
Thermal resistance	R θ_{j-b} ^[5]	17	°C /W

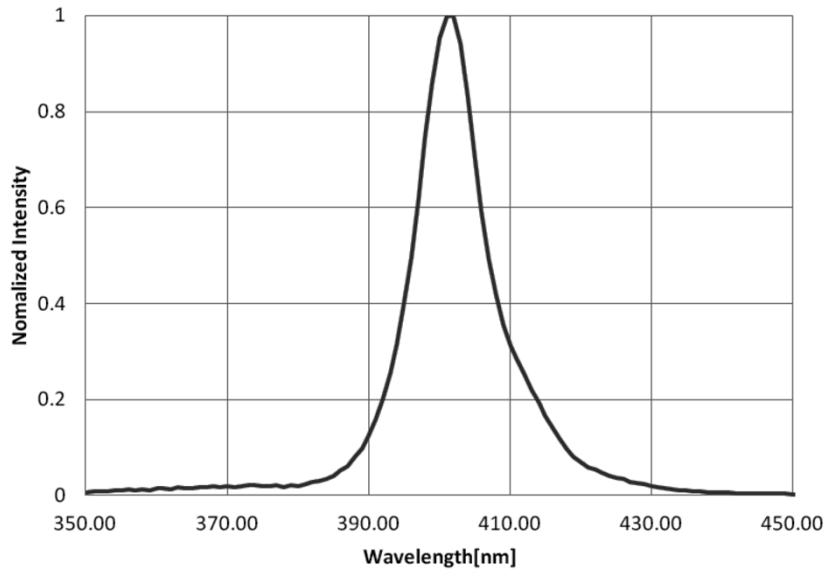
Notes :

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%
5. R θ_{j-b} is the thermal resistance between chip junction to PCB board bottom.
The PCB is made of aluminium and the size of PCB is 3.5cm by 3.5cm

Characteristic Diagrams

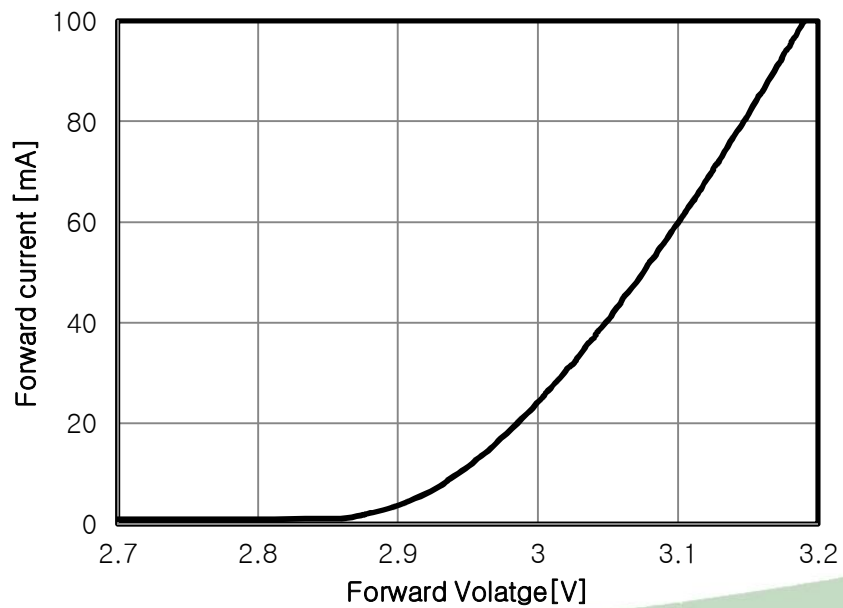
1. Relative Spectral Power Distribution

($I_F=50\text{mA}$, $T_a=25^\circ\text{C}$, $\text{RH}=30\%$)



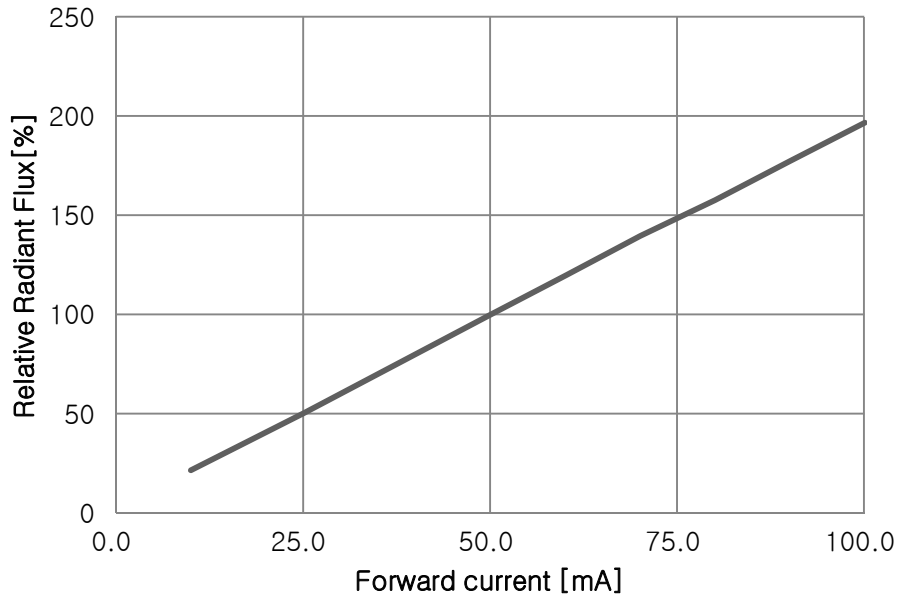
2. Forward Current VS Forward Voltage

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



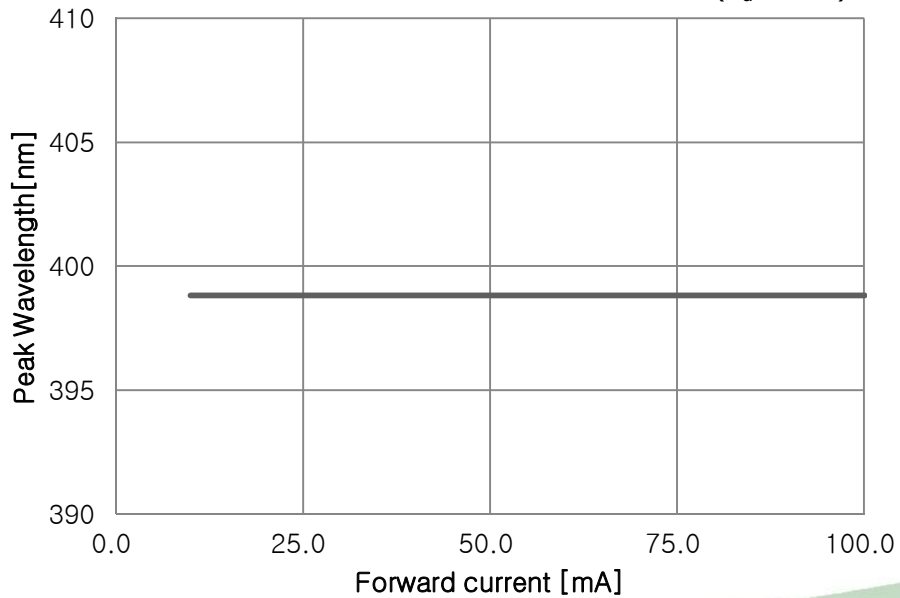
3. Relative Radiant Flux VS Forward Current

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

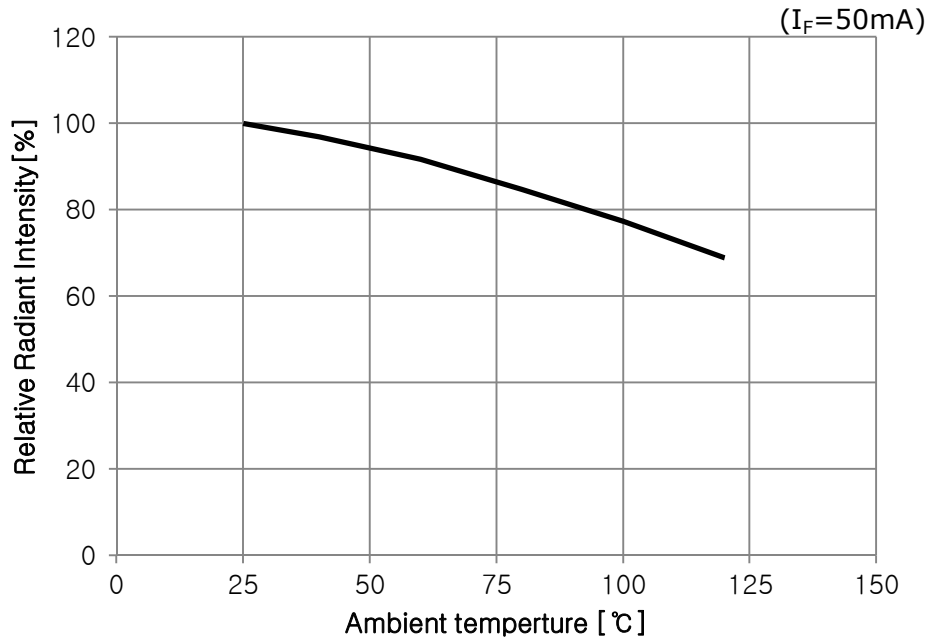


4. Peak Wavelength VS Forward Current

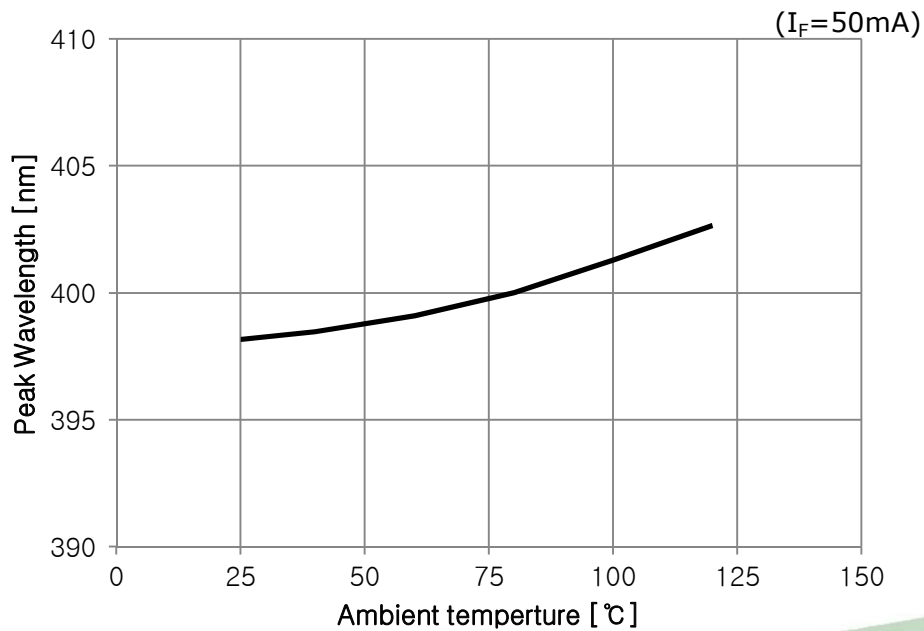
($T_a=25^\circ\text{C}$)



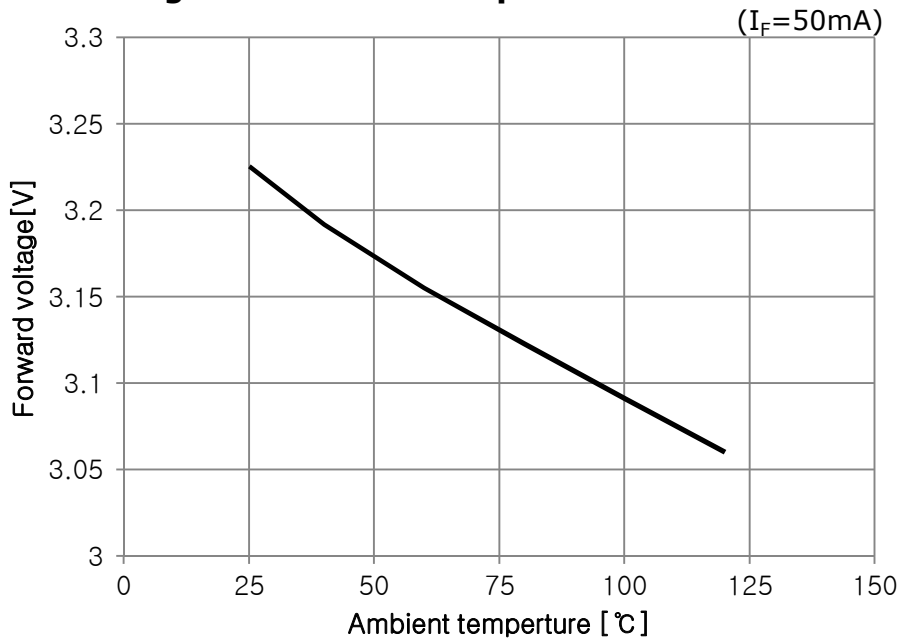
5. Relative Radiant Intensity VS Ambient Temperature



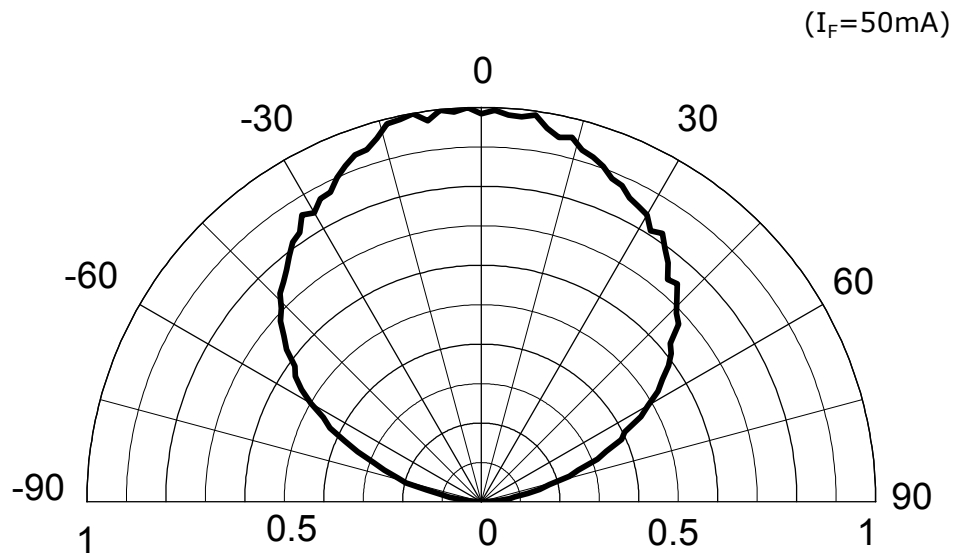
6. Peak Wavelength VS Ambient Temperature



7. Forward Voltage VS Ambient Temperature



8. Radiation pattern



Binning & Labeling

1. Binning Structure

Y₁Y₂Y₃Y₄Y₅Y₆

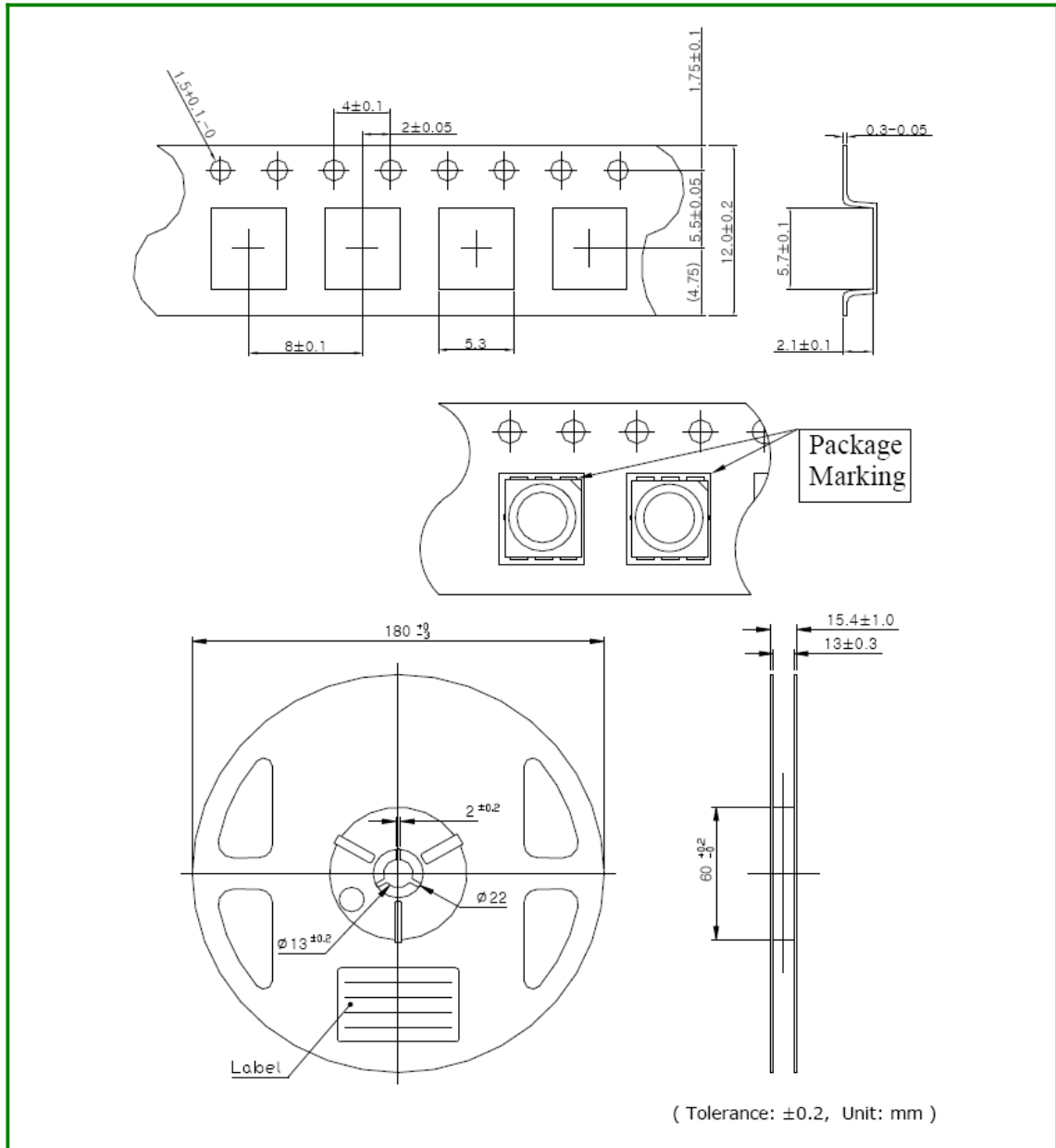
(I_F=50mA)

Code	Parameter	간격	CODE	MIN	MAX
Y1Y2	Peak wavelength	5nm	n2	395.0	400.0
			P1	400.0	405.0
Y3Y4	Radiant Flux	5mW	E0	45.0	50.0
			F0	50.0	55.0
		2.5mW	A3	55.0	57.5
			A4	57.5	60.0
			B1	60.0	62.5
			B2	62.5	65.0
			C0	65.0	67.5
			C1	67.5	70.0
			D0	70.0	72.5
			D1	72.5	75.0
Y5Y6	Forward Voltage	0.1V	Z1	3.0	3.1
			Z2	3.1	3.2
			Z3	3.2	3.3
			Z4	3.3	3.4

Notes :

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

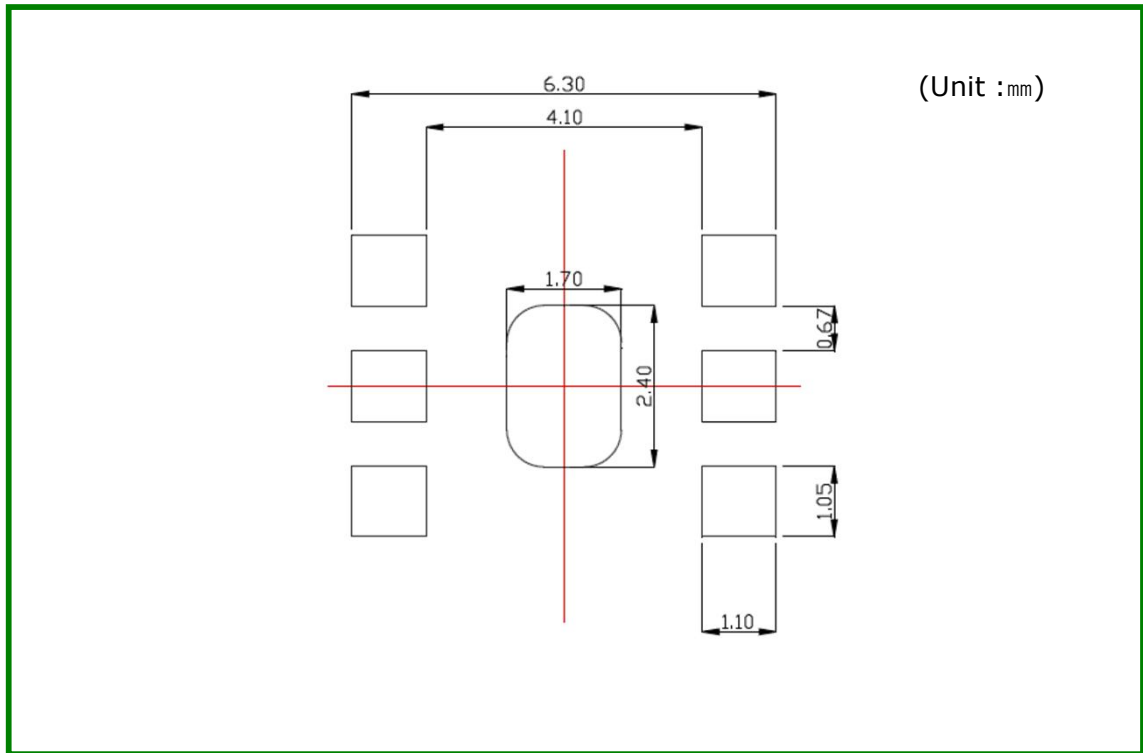
Reel Packaging



Notes :

1. Quantity : 1200pcs/Reel
2. Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ± 0.2 mm
3. Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10° to the carrier tape
4. Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof package

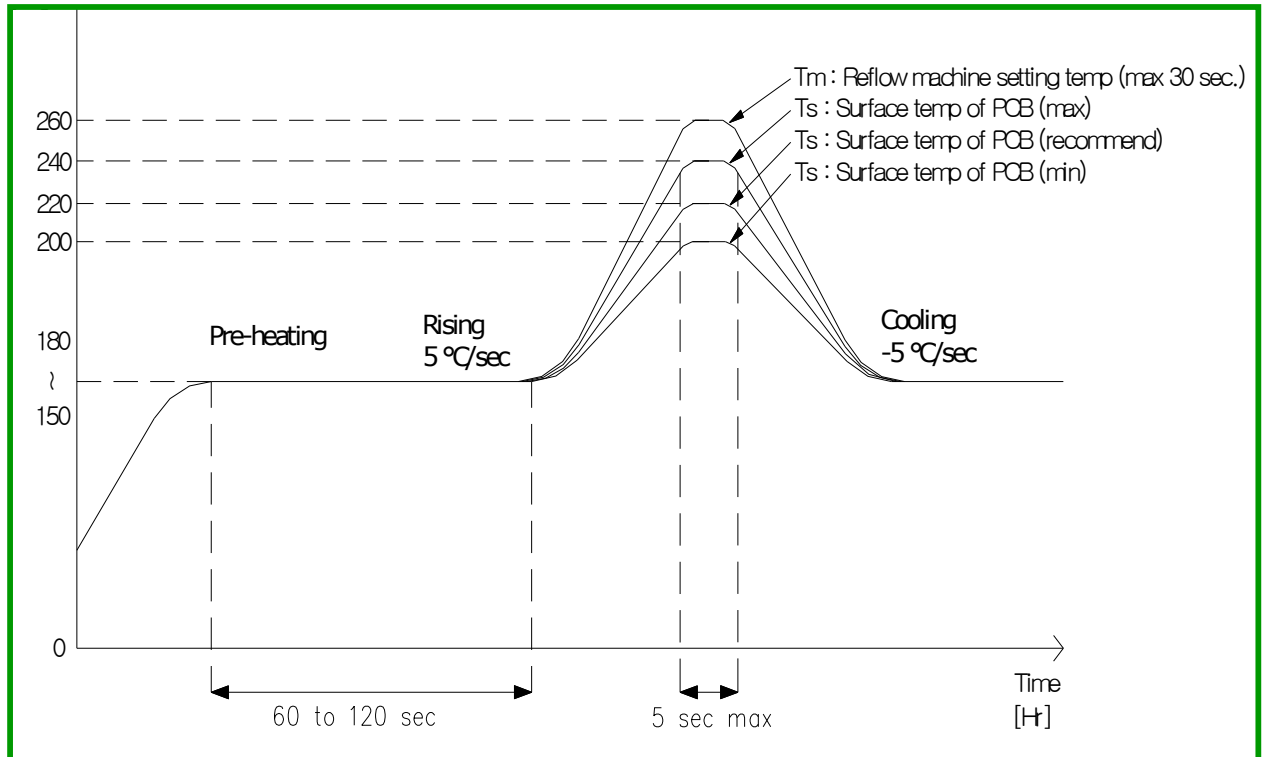
Recommended solder pad



Notes :

1. All dimensions are in millimeters.
 2. Scale : none
 3. Undefined tolerance is $\pm 0.1\text{mm}$
- This drawing without tolerances are for reference only

Reflow Soldering Profile



* 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.

Reliability

1. Relative Spectral Power Distribution

Test Item	Test Condition	Note	# Failed /Tested
High Temp. Operational Life	Ta=85℃, IF=50mA	1000hrs	0/20
Room Temp. Operational Life	Ta=25℃, IF=50mA	1000hrs	0/20
High Humidity High Temp. Operational Life	Ta=60℃, RH=90%, IF=50mA	1000hrs	0/20
Thermal shock	Ta max=100℃, Ta min=-40℃ 30min dwell/transfer time : 10sec, 1 cycle=1hr	200 cycles	0/22
Resistance to Soldering	Temp=260±5℃, Time : 10±1 sec	1 time	0/10
Solderability	Temp=260±5℃, 95% Coverage	1 time	0/10
ESD	R=1.5kΩ, C=100pF Voltage level=2kV	3 times Negative /positive	0/22

2. Failure Criteria

Parameter	Symbol	Test Conditions	Max. or Min. allowable shift value
Forward Voltage	V _F	IF=50mA	Max. Initial measurement x 1.2
Radiant Flux	Φ _e	IF=50mA	Min. Initial measurement x 0.7

Notes :

1. The value is measured after the test sample is cooled down to the room temperature.

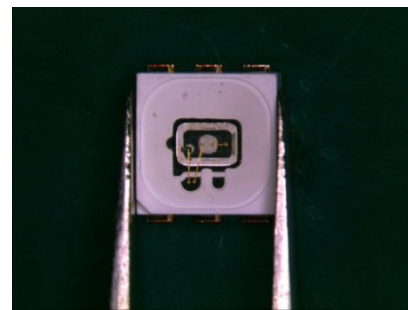
Precaution for use

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°C and 30°C 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.
- If the package has been opened more than 4 week(MSL_2a) or the color of the desiccant changes, components should be dried for 10-12hr at 60±5°C
- The conditions of resealing are as follows
 - Temperature is 5 to 40°C and Relative humidity is less than 30%

2) Handling Precautions

- VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor them when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues.
- 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.
- The UV LED is encapsulated with a silicone resin for the highest flux efficiency. So it needs to be handled carefully as below
 - Avoid touching silicone resin parts especially with sharp tools such as pincettes(Tweezers)



Precaution for use

- Avoid leaving fingerprints on silicone resin parts.
- Silicone resin will attract dust so use covered containers for storage.
- When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that excessive mechanical pressure on the surface of the resin must be prevented.
- It is not recommend to cover the silicone resin of the LEDs with other resin (epoxy, urethane, etc).

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, organic 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.

