Technical Data Sheet

RoHS

Specification

CUN76A1A

SVC		Customer
Drawn	Approval	Approval

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CUN76A1A

CUN76A1A

Description

High power UV LED series are designed for high current operation and high power output applications.
It incorporates state of the art SMD design and low thermal resistant material.
Z5 NUV LED is ideal UV light source for curing, printing, and detecting applications.

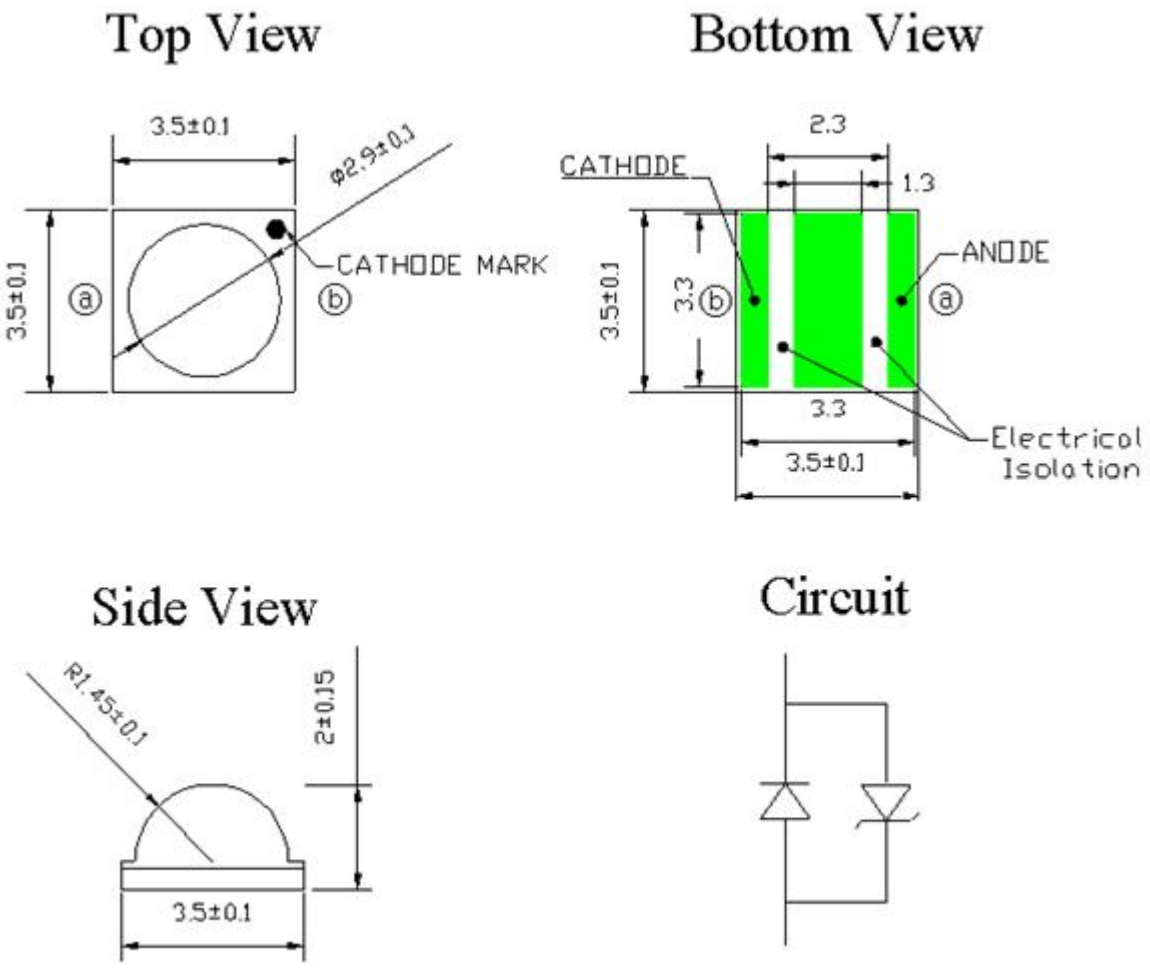
Features

- Super high power output
- Designed for high current operation
- Low thermal resistance
- SMT solderable
- Lead Free product
- RoHS compliant

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 ±0.2mm

Characteristics of CUN76A1A

1. CUN76A1A (375nm)

1-1 Electro-Optical characteristics at 350mA

(T_a=25℃, RH=30%)

Parameter	Symbol	Value	Unit
Peak wavelength [1]	λ_p	375	nm
Radiant Flux [2] @ 350mA	Φ_e[3]	230	mW
Radiant Flux @ 500mA	Φ_e	320	mW
Forward Voltage [4]	V_F	3.6	V
Spectrum Half Width	$\Delta\lambda$	10	nm
View Angle	$2\Theta_{1/2}$	130	deg.
Thermal resistance	$R\theta_{J-s}$[5]	11	ºC /W

1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I_F	500	mA
Junction Temperature	T_j	125	ºC
Operating Temperature	T_{opr}	-10 ~ +85	ºC
Storage Temperature	T_{stg}	-40 ~ +100	ºC

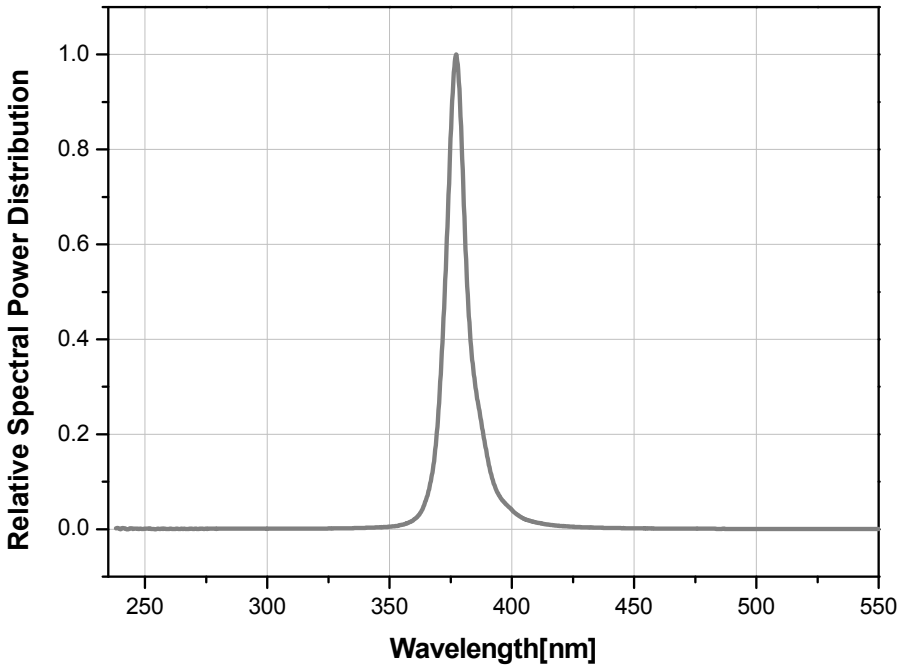
Notes :

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. $R\theta_{J-s}$ is the thermal resistance between chip junction to package bottom.

Characteristic Diagrams

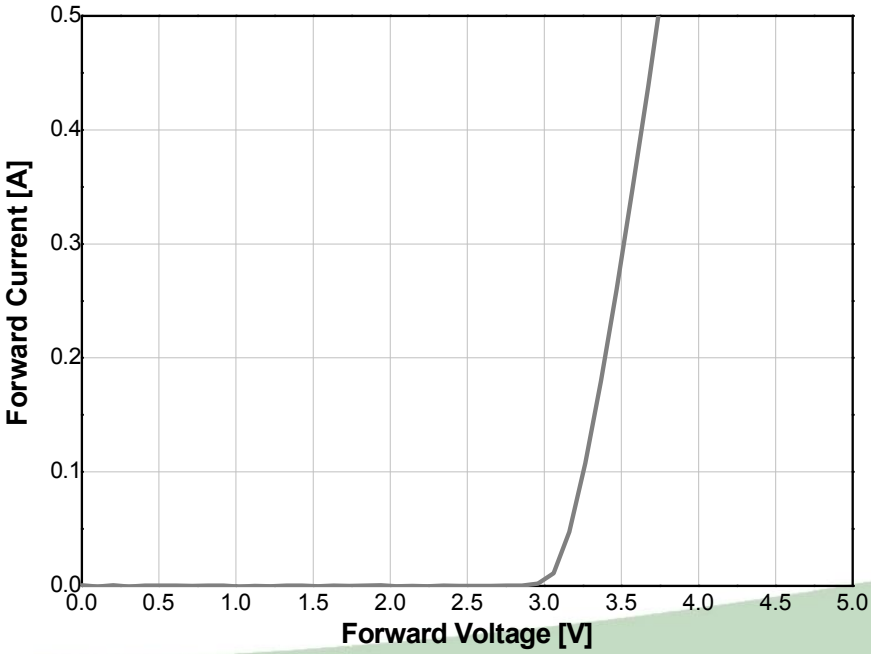
1. Relative Spectral Power Distribution

(I_F=350mA, T_a=25℃, RH=30%)



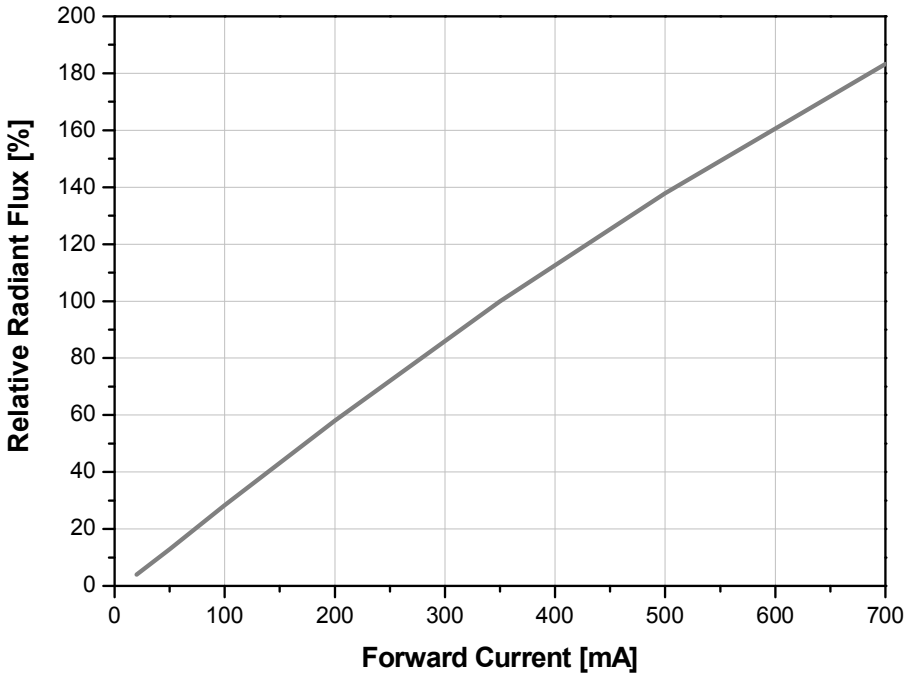
2. Forward Current VS Forward Voltage

(T_a=25℃)



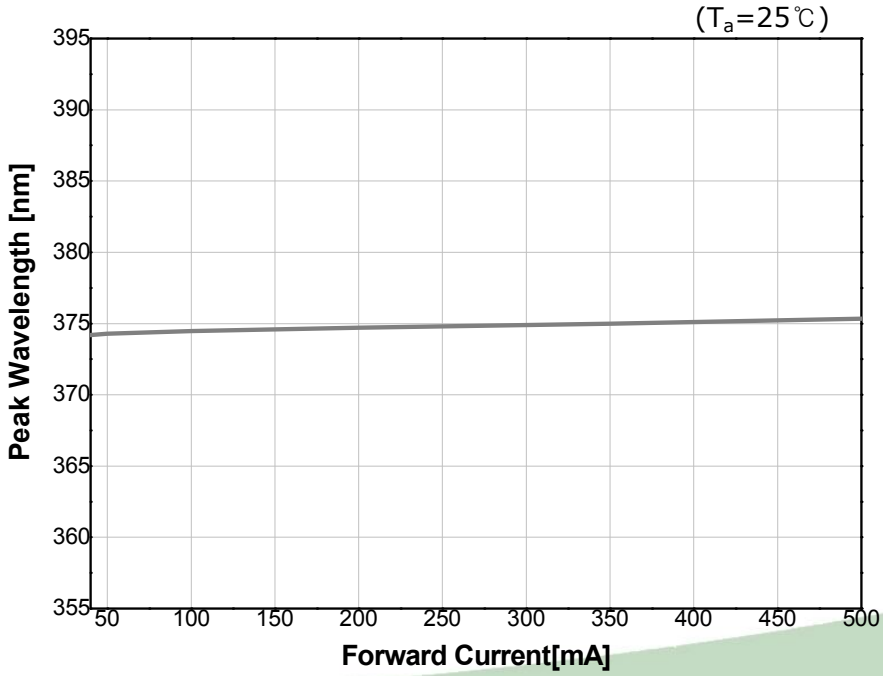
3. Relative Radiant Flux VS Forward Current

(T_a=25℃)

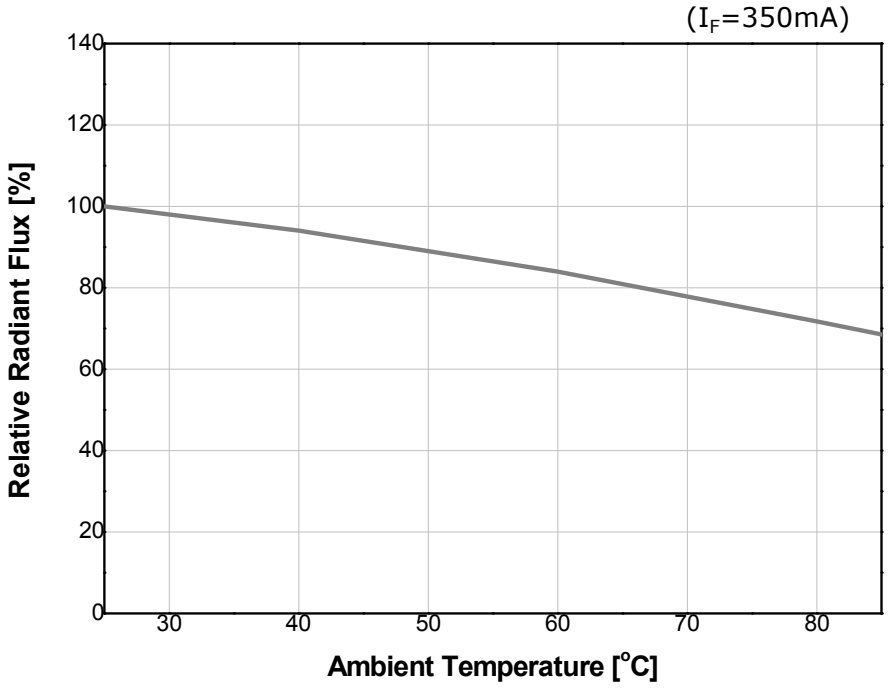


4. Peak Wavelength VS Forward Current

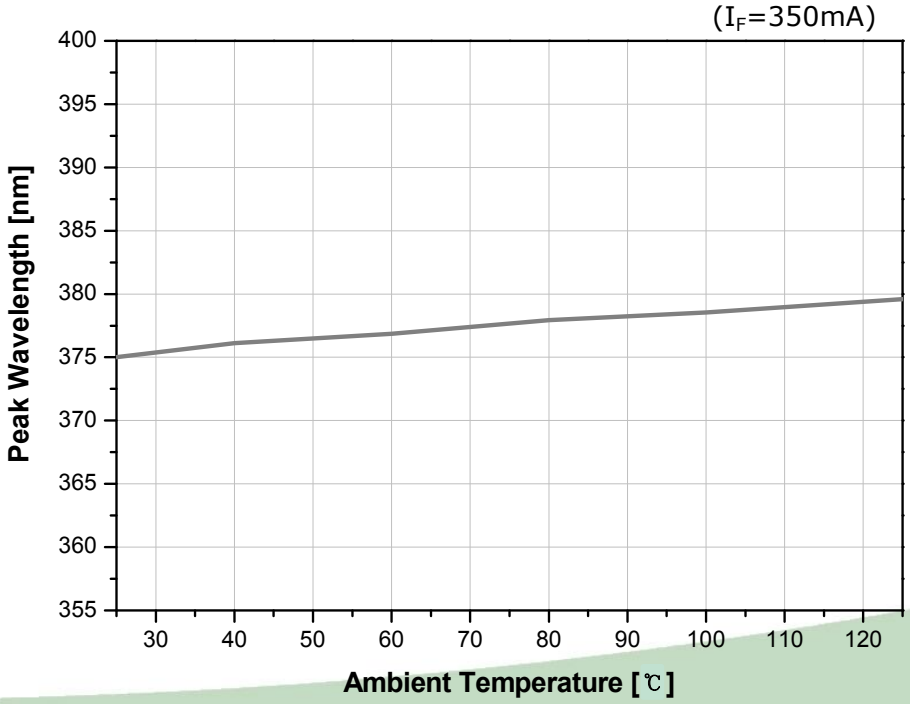
(T_a=25℃)



5. Relative Radiant Flux VS Ambient Temperature

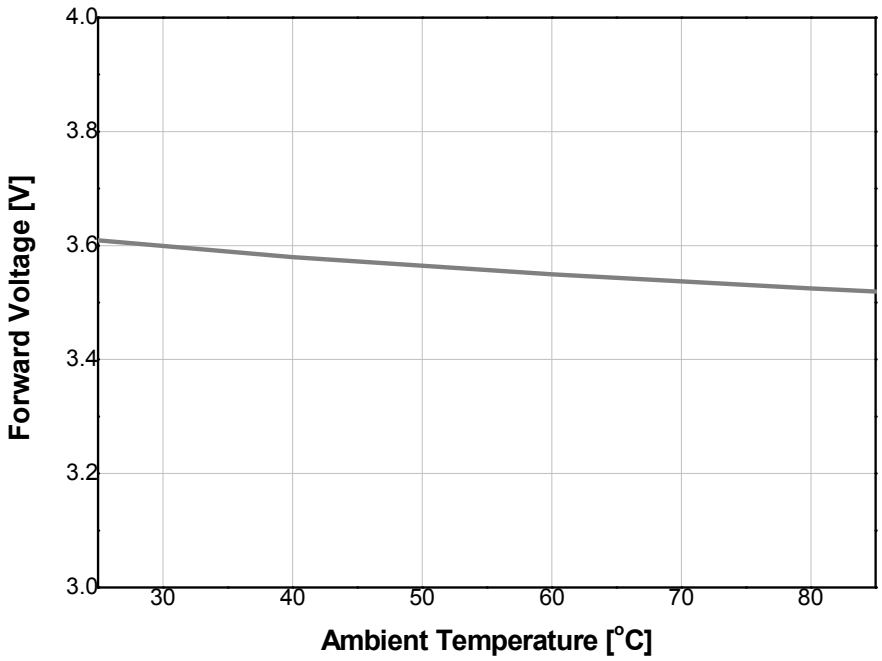


6. Peak Wavelength VS Ambient Temperature



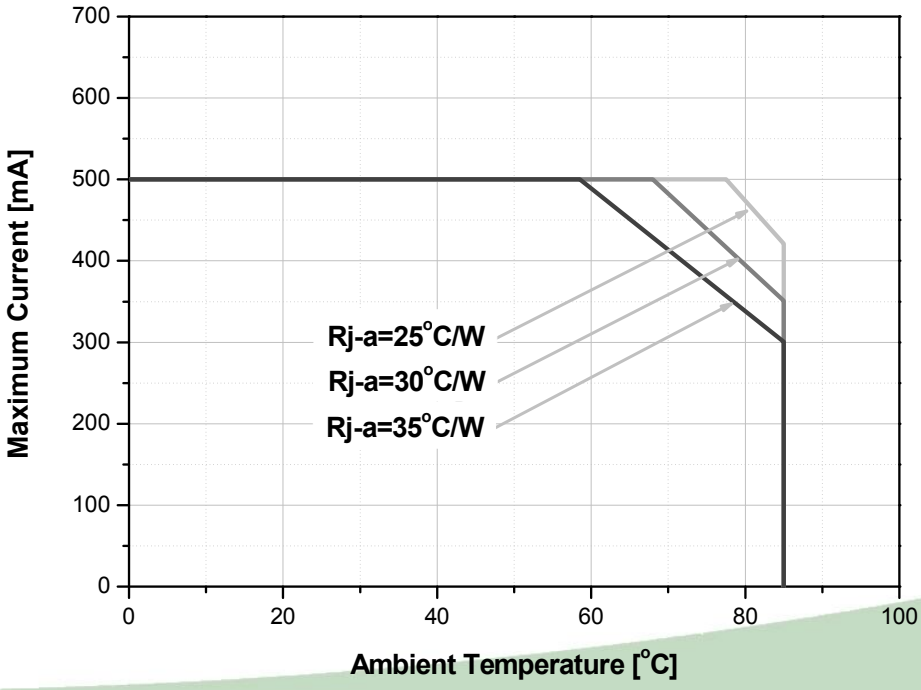
7. Forward Voltage VS Ambient Temperature

(I_F=350mA)

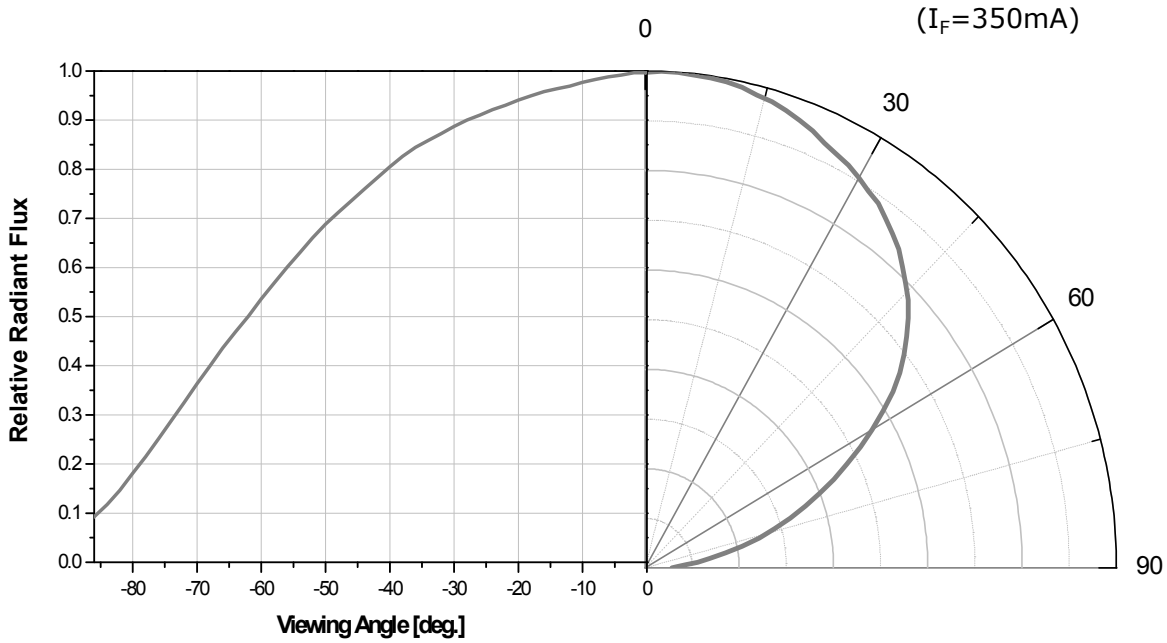


8. Allowable Forward Current VS Ambient Temperature

($T_{j_{max}}$ = 125℃ I_F=500mA)



9. Radiation pattern



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Binning & Labeling

1. Binning Structure

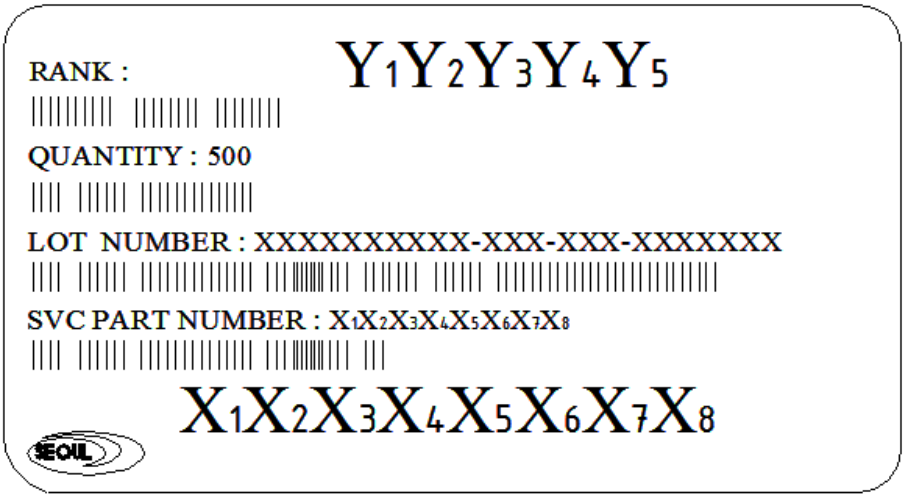
$\underline{Y_1Y_2Y_3Y_4Y_5}$

T_a=25℃, I_F=350mA

Y_1Y_2			Y_3Y_4			Y_5		
Peak Wavelength [nm]			Radiant Flux [mW]			Forward Voltage [V]		
	MIN	MAX		MIN	MAX		MIN	MAX
k	370	380	G2	120	140	a	3.0	3.4
			G3	140	160	b	3.4	3.8
			G4	160	180	c	3.8	4.2
			G5	180	200			
			H1	200	230			
			H2	230	260			
			H3	260	290			
			H4	290	320			

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

2. Label



3. SVC PART NUMBER : $X_1X_2X_3X_4X_5X_6X_7X_8$

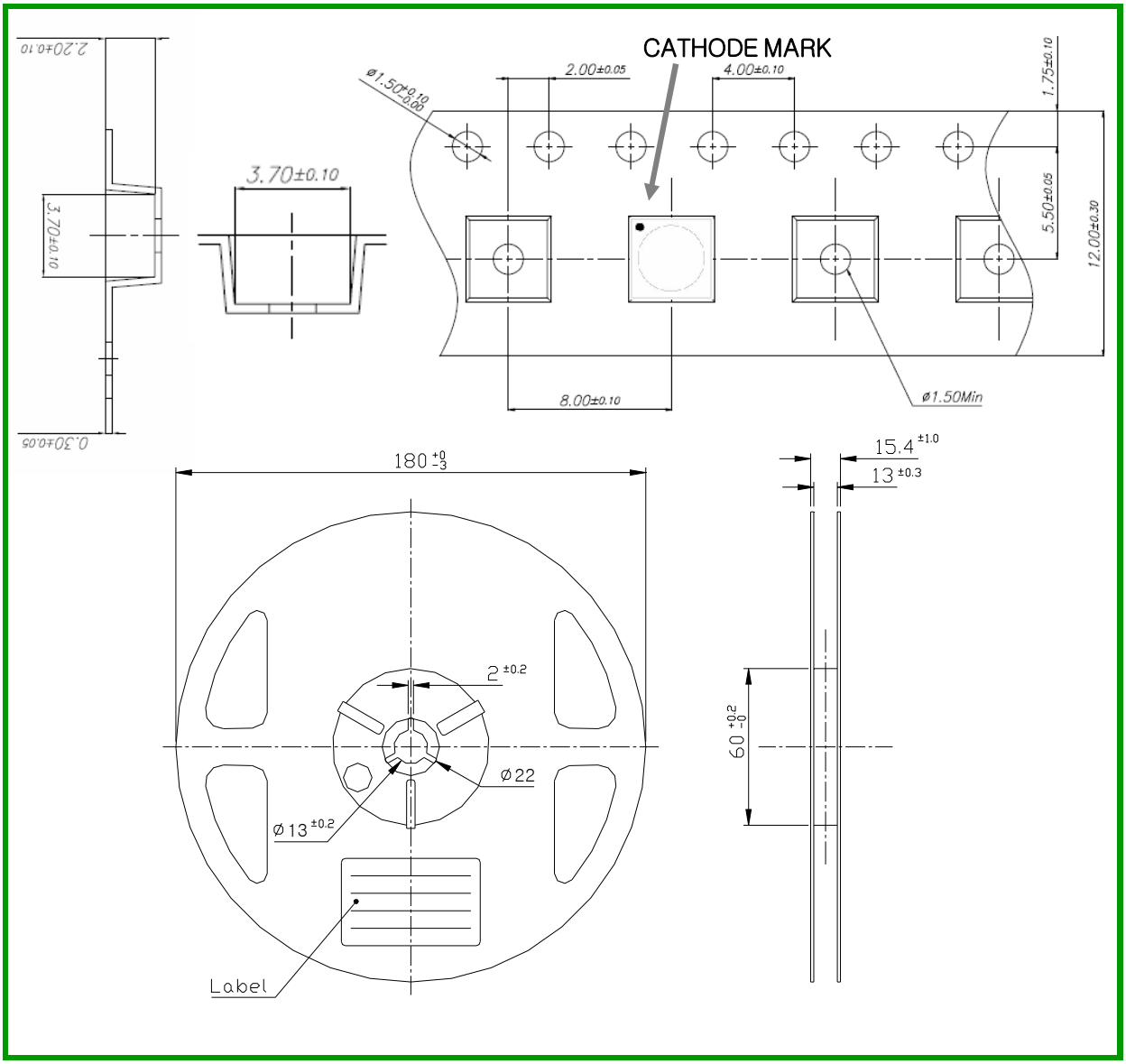
X_1		X_2		X_3X_4		X_5		X_6		X_7		X_8	
Company		Product Line		Wavelength		PKG Series		Lens Type		Chip Q'ty		Ver	
SVC	**C**	UV	**U**	Near 375	**N7**	Z5	**6**	Dome-Wide	**A**	1	**1**	ver0	**A**

4. Rank

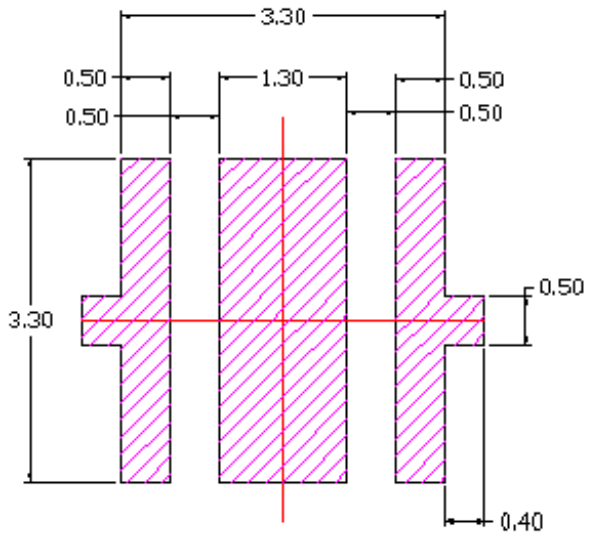
$Y_1Y_2Y_3Y_4Y_5$

- Y_1Y_2 : Peak Wavelength [nm]
- Y_3Y_4 : Radiant Flux [mW]
- Y_5 : Forward Voltage [V]

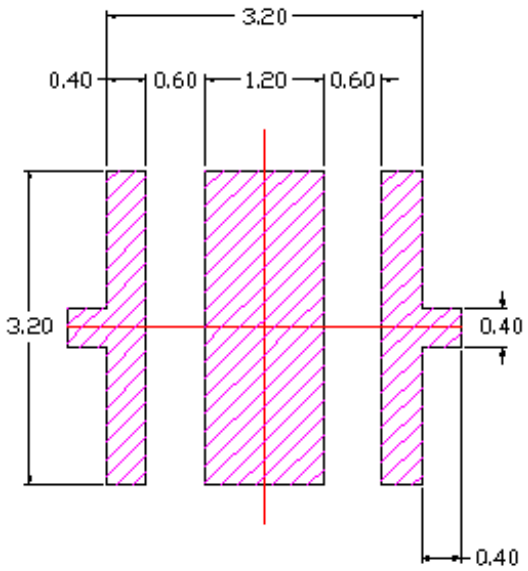
Reel Packaging



Recommended solder pad



Recommended PCB Solder Pad



Recommended Stencil Pattern

Notes :

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

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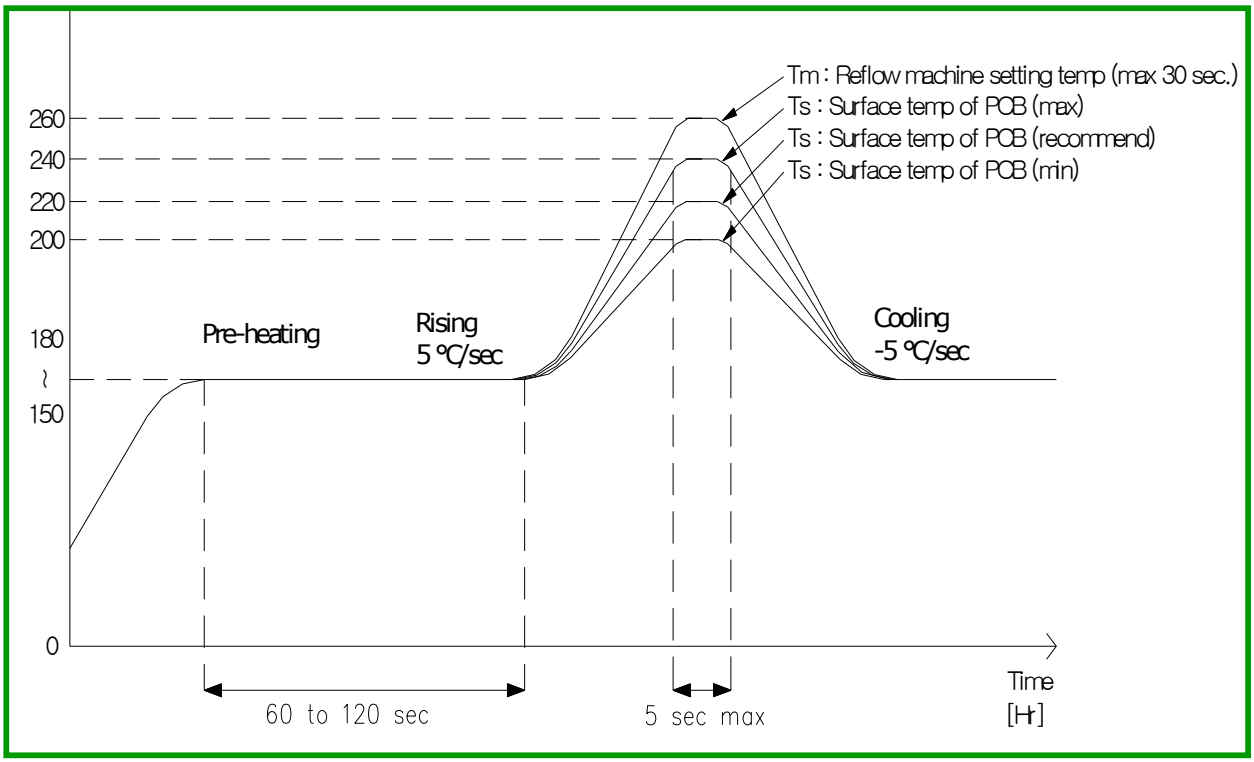
Reflow Soldering Profile



*** 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=350mA	1000hrs	0/10
Low Temp. Operational Life	Ta=-40℃, IF=350mA	1000hrs	TBD
Room Temp. Operational Life	Ta=25℃, IF=350mA	1000hrs	0/10
High Humidity High Temp. Operational Life	Ta=60℃, RH=90%, IF=350mA	1000hrs	0/10
High Temp. Storage	Ta = 100℃	1000hrs	TBD
Thermal shock	Ta max=120℃, Ta min=-40℃ 30min dwell/transfer time : 10sec, 1 cycle=1hr	200 cycles	0/10
Resistance to Soldering	Temp=260±5℃, Time : 10±1 sec	1 time	0/10
Solderability	Temp=260±5℃, 95% Coverage	1 time	0/10
Vibration Variable Frequency	100~1000~100Hz, 20G, Sweep 4 min, 3 directions, 4 cycles	48min.	TBD
ESD	R=1.5kΩ, C=100pF Voltage level=2kV	3 times Negative /positive	0/10

2. Failure Criteria

Parameter	Symbol	Test Conditions	Max. or Min. allowable shift value
Forward Voltage	V_F	IF=350mA	Max. Initial measurement x 1.2
Radiant Flux	Φ_e	IF=350mA	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℃ 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.
- If the package has been opened more than 4 eek(MSL_2a) or the color of the desiccant changes, components should be dried for 10-12hr at 60±5℃
- 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 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)
  - 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

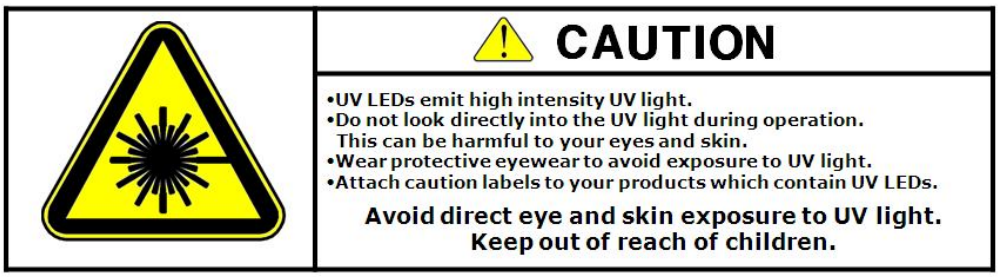
- The Products emit high intensity ultraviolet light which can make your eyes and skin harmful, So do not look directly into the UV light and wear protective equipment during operation.

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.



Revision history

REV	Change Date	Brief summary of change
00	May 18, 2012	Initial specification
01	October 29, 2012	1. Change the measurement of $R_{\theta J-s}$ 2. Add reliability section
02	February 13, 2013	Change view angle
01	February 21, 2014	Data upgrade