

P8D1

Power UV LED Series is designed for high current operation and high flux output applications.

Furthermore, its thermal management characteristic is better than other UV LED solutions by SMD design package and good thermal emission material.

According to these advantages, Power UV LED Series is the ideal UV source for various UV applications such as UV curing, coating, printing and high quality counterfeit Detectors, Etc.



P8D1

Features

- Super high Flux output
- and high Luminance
- Designed for high current operation
- Low thermal resistance
- SMT solderability
- Lead Free product
- RoHS compliant

Applications

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

Full Code of Power UV LED Series

Full code form : $X_1 X_2 X_3 X_4 X_5 X_6 - X_7 X_8 - X_9 X_{10} X_{11} X_{12} X_{13}$

1. Part Number

- X_1 : Package type (Power UV LED : "P")
- X_2 : Package outline size
- X_3 : LENS type
- X_4 : Chip quantity (or Power Dissipation)
- X_5 : *
- X_6 : *

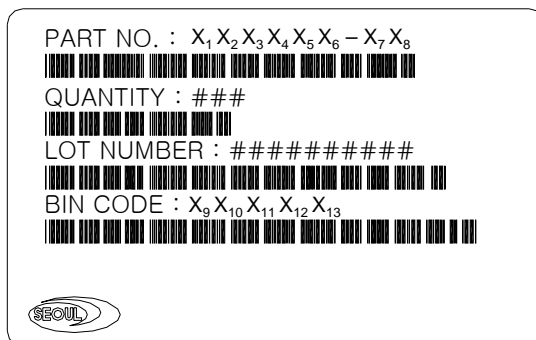
2. Internal Number

- X_7
- X_8

3. Code Labeling

- $X_9 X_{10}$: Peak Wavelength
- $X_{11} X_{12}$: Radiant Flux
- X_{13} : Forward voltage

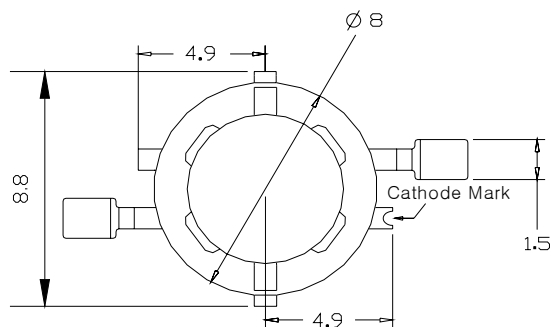
4. Sticker Diagram on Reel & Aluminum Vinyl Bag



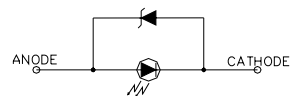
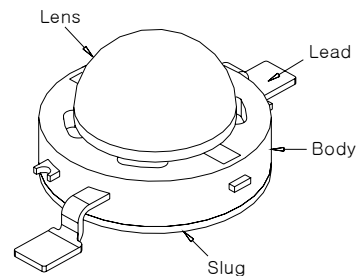
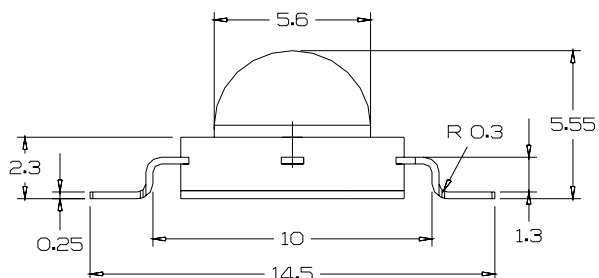
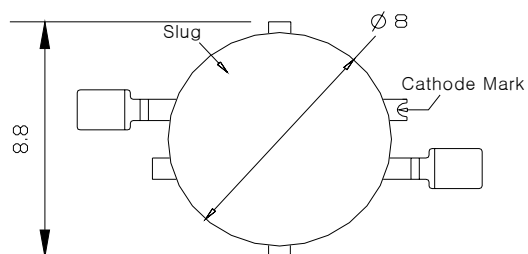
For more information about binning and labeling, refer to the Application Note -1

Outline Dimensions

TOP VIEW



BOTTOM VIEW



Notes :

1. All dimensions are in millimeters. (tolerance : ± 0.2)
2. Scale : none
3. Slug of package is connected to anode(+).

*The appearance and specifications of the product may be changed for improvement without notice.

Characteristics for Power UV LED

1. P8D1 (Peak wavelength Rank : j, 360-370nm)

1-1. Electro-Optical characteristics at $I_F=350\text{mA}$, $T_A=25^\circ\text{C}$

Parameter	Symbol	Value			Unit	
		Min	Typ	Max		
Peak wavelength ¹	λ_p	360	365	370	nm	
Optical Power Output ²	P_o ³	F1	40	-	50	mW
		F2	50	-	60	
		F3	60	-	70	
Forward Voltage ⁴	V_F	-	3.9	4.5	V	
Spectrum Half Width	$\Delta\lambda$	-	18	-	nm	
View Angle	$2\theta_{1/2}$	130			deg.	
Thermal resistance ⁵	$R\theta_{J-B}$	14			$^\circ\text{C}/\text{W}$	
Thermal resistance ⁶	$R\theta_{J-C}$	12.5			$^\circ\text{C}/\text{W}$	

1-2. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I_F	0.4	A
Power Dissipation	P_D	1.8	W
Junction Temperature	T_j	125	$^\circ\text{C}$
Operating Temperature	T_{opr}	-30 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^\circ\text{C}$

Notes :

1. Peak Wavelength Measurement tolerance : $\pm 3\text{nm}$
2. Optical Power Output Measurement tolerance : $\pm 10\%$
3. P_o is the Total Radiant Flux as measured with an integrated sphere.
4. Forward Voltage Measurement tolerance : $\pm 3\%$
- 5, 6. $R\theta_{J-B}$ is measured with a SOC metal core PCB. ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$)
 $R\theta_{J-C}$ is measured with only emitter. ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$)
 Break voltage of Metal PCB is 6.5kVAC
7. It contains a zener chip to protect the product from ESD.

-----Caution-----

1. Please do not drive at rated current more than 5 sec. without proper heat sink.

Characteristics for Power UV LED

2. P8D1 (Peak wavelength Rank : k, 370-380nm)

2-1. Electro-Optical characteristics at $I_F=350\text{mA}$, $T_A=25^\circ\text{C}$

Parameter	Symbol	Value			Unit	
		Min	Typ	Max		
Peak wavelength ¹	Wp	370	375	380	nm	
Optical Power Output ²	Po ³	G1	100	-	120	mW
		G2	120	-	140	
		G3	140	-	160	
		G4	160	-	180	
		G5	180	-	200	
Forward Voltage ⁴	V _F	-	3.9	4.5	V	
Spectrum Half Width	$\Delta\lambda$	-	11	-	nm	
View Angle	2 Θ 1/2	130			deg.	
Thermal resistance ⁵	R Θ_{J-B}	13			°C /W	
Thermal resistance ⁶	R Θ_{J-C}	11.5			°C /W	

2-2. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I _F	0.4	A
Power Dissipation	P _D	1.8	W
Junction Temperature	T _j	125	°C
Operating Temperature	T _{opr}	-30 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C

Notes :

1. Peak Wavelength Measurement tolerance : $\pm 3\text{nm}$
2. Optical Power Output Measurement tolerance : $\pm 10\%$
3. Po is the Total Radiant Flux as measured with an integrated sphere.
4. Forward Voltage Measurement tolerance : $\pm 3\%$
- 5, 6. R Θ_{J-B} is measured with a SOC metal core PCB. ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$)
 R Θ_{J-C} is measured with only emitter. ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$)
 Break voltage of Metal PCB is 6.5kVAC
7. It contains a zener chip to protect the product from ESD.

-----Caution-----

1. Please do not drive at rated current more than 5 sec. without proper heat sink.

Characteristics for Power UV LED

3. P8D1 (Peak wavelength Rank : p, 400-410nm)

3-1. Electro-Optical characteristics at $I_F=350\text{mA}$, $T_A=25^\circ\text{C}$

Parameter	Symbol	Value			Unit	
		Min	Typ	Max		
Peak wavelength ¹	W_p	400	405	410	nm	
Optical Power Output ²	P_o ³	H1	200	-	230	mW
		H2	230	-	260	
		H3	260	-	290	
		H4	290	-	320	
Forward Voltage ⁴	V_F	-	3.4	4.2	V	
Spectrum Half Width	$\Delta\lambda$	-	15	-	nm	
View Angle	2θ 1/2	130			deg.	
Thermal resistance ⁵	$R\theta_{J-B}$	9			$^\circ\text{C}/\text{W}$	
Thermal resistance ⁶	$R\theta_{J-C}$	7.5			$^\circ\text{C}/\text{W}$	

3-2. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Forward Current	I_F	0.4	A
Power Dissipation	P_D	1.7	W
Junction Temperature	T_j	125	$^\circ\text{C}$
Operating Temperature	T_{opr}	-30 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^\circ\text{C}$

Notes :

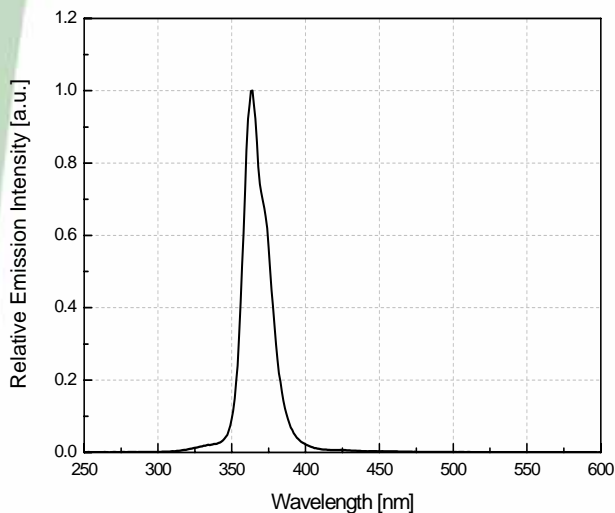
1. Peak Wavelength Measurement tolerance : $\pm 3\text{nm}$
2. Optical Power Output Measurement tolerance : $\pm 10\%$
3. P_o is the Total Radiant Flux as measured with an integrated sphere.
4. Forward Voltage Measurement tolerance : $\pm 3\%$
- 5, 6. $R\theta_{J-B}$ is measured with a SOC metal core PCB. ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$)
 $R\theta_{J-C}$ is measured with only emitter. ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$)
 Break voltage of Metal PCB is 6.5kVAC
7. It contains a zener chip to protect the product from ESD.

-----Caution-----

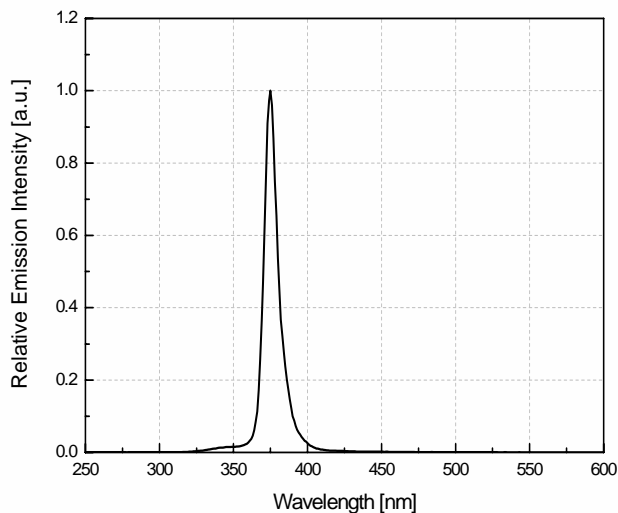
1. Please do not drive at rated current more than 5 sec. without proper heat sink.

Spectrum Characteristics, Ta=25°C, 350mA

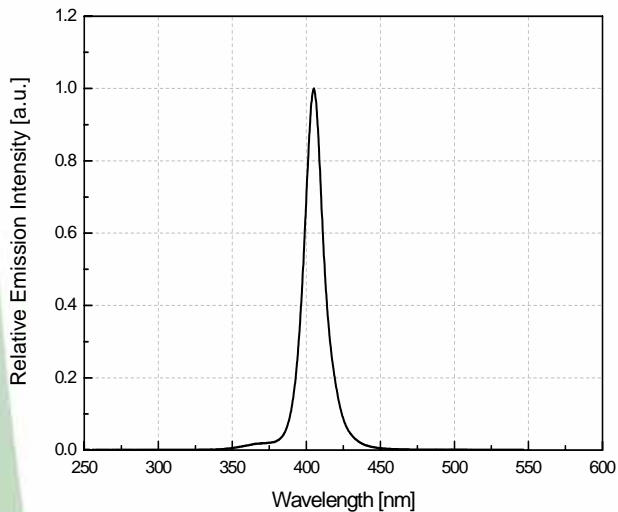
1. Peak Wavelength : j (360-370nm)



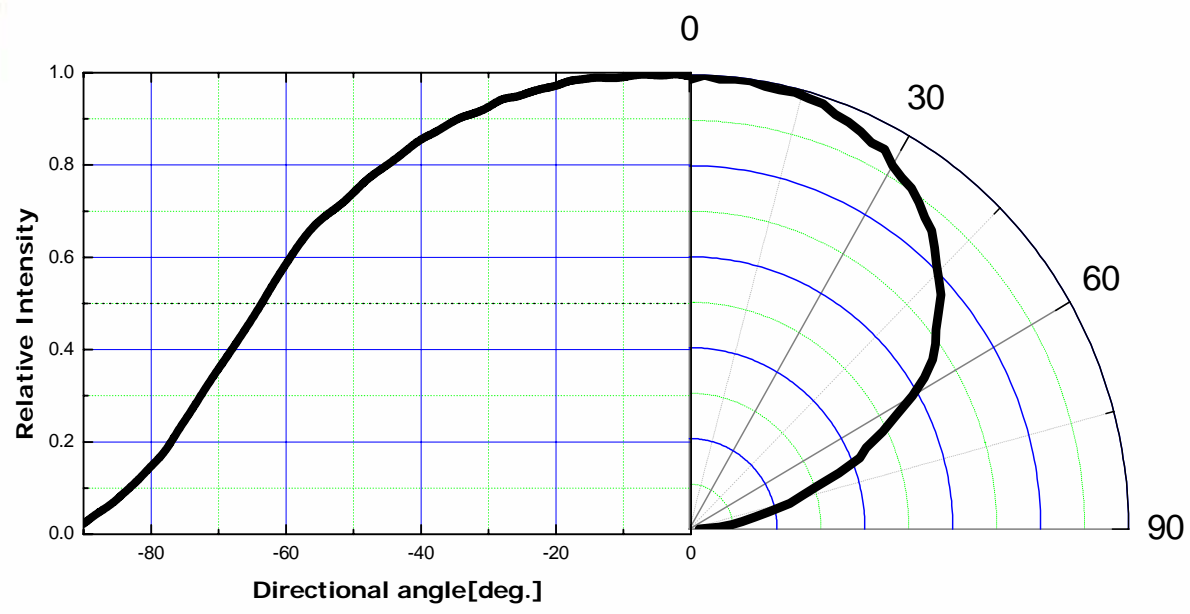
2. Peak Wavelength : k (370-380nm)



3. Peak Wavelength : p (400-410nm)

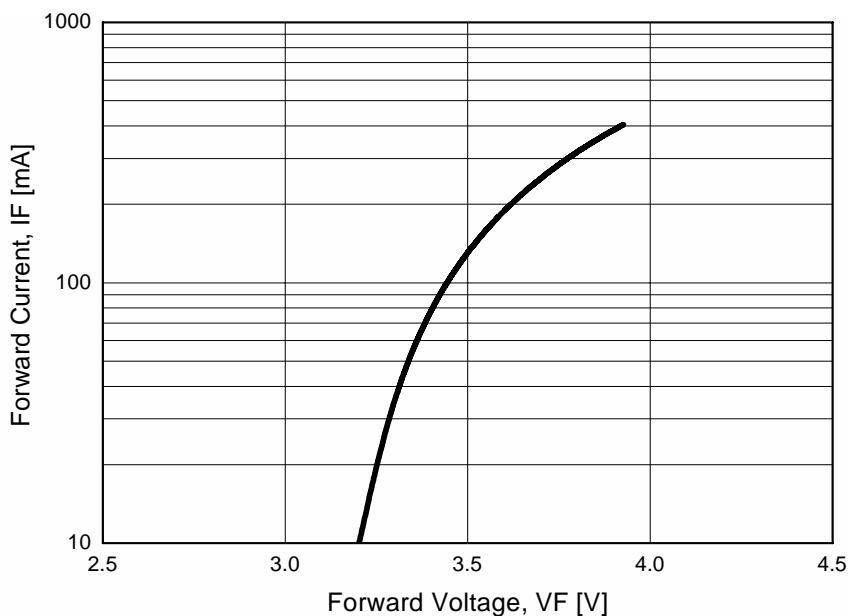


Typical Dome Type Radiation Pattern

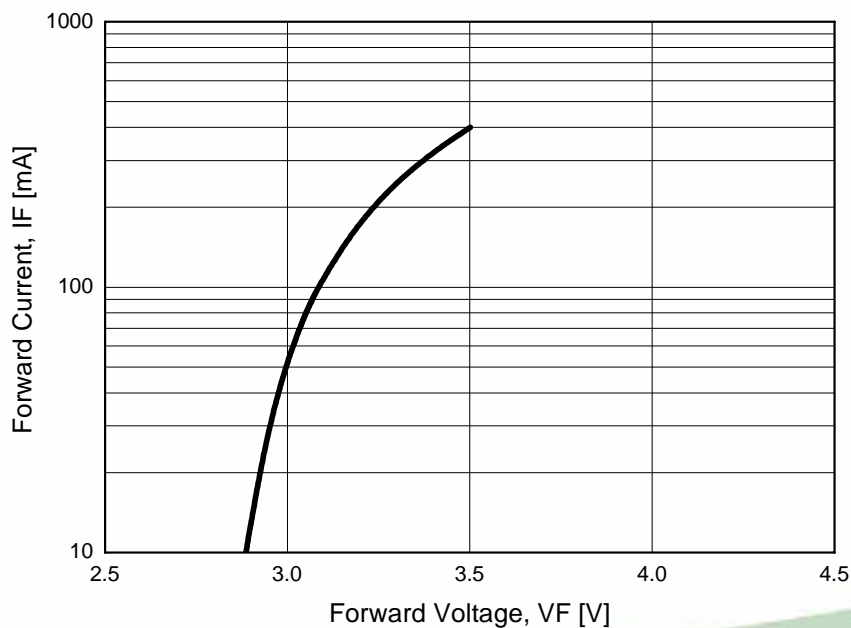


Forward Current Vs. Forward Voltage

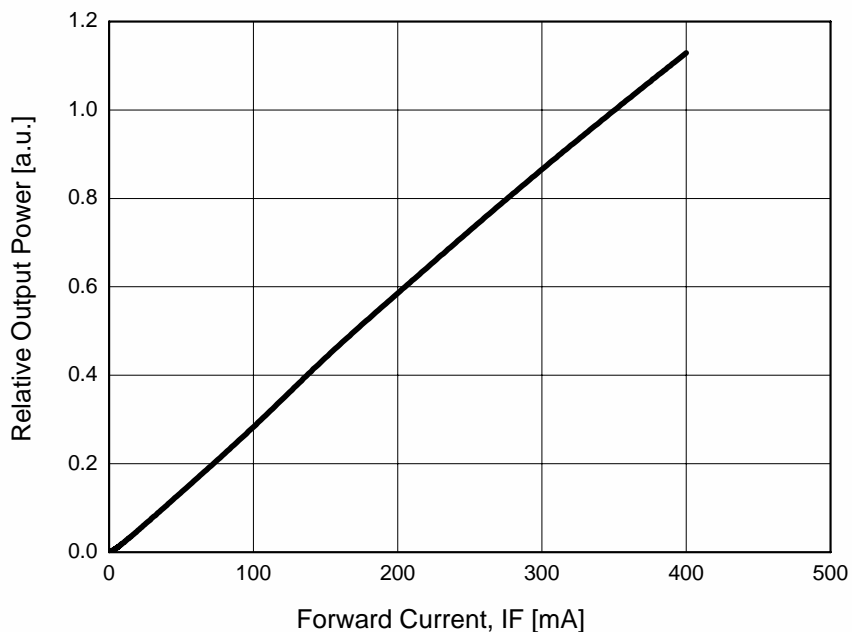
1. Peak Wavelength : j, k (360-370nm, 370~380nm)



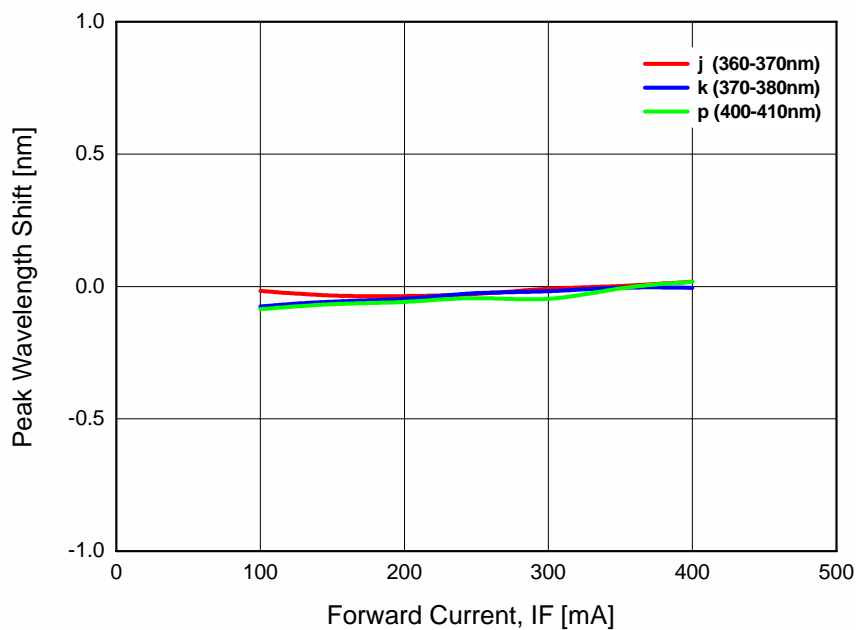
2. Peak Wavelength : p (400-410nm)



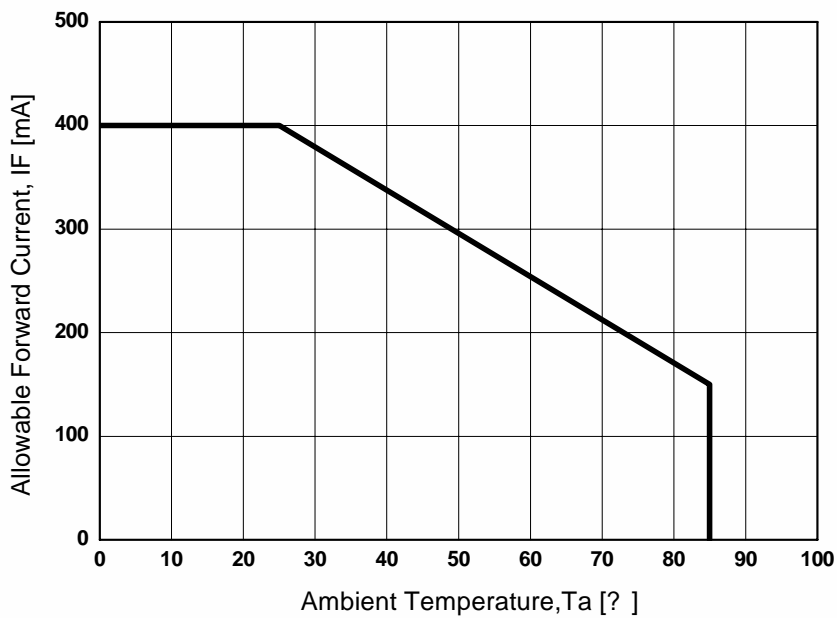
Forward Current Vs. Relative Output Power



Forward Current Vs. Peak Wavelength Shift

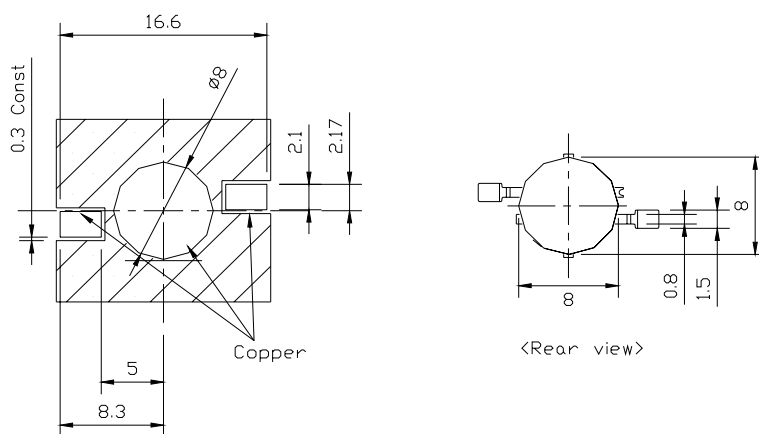
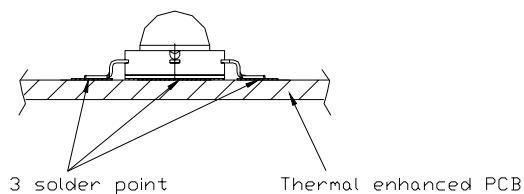


Forward Current Vs. Relative Output Power

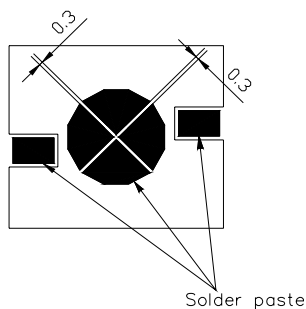


Recommended Soldering Pattern

1. Solder Pad



2. Solder Paste Pattern



Notes : 1.Paste thickness : 0.2mm.

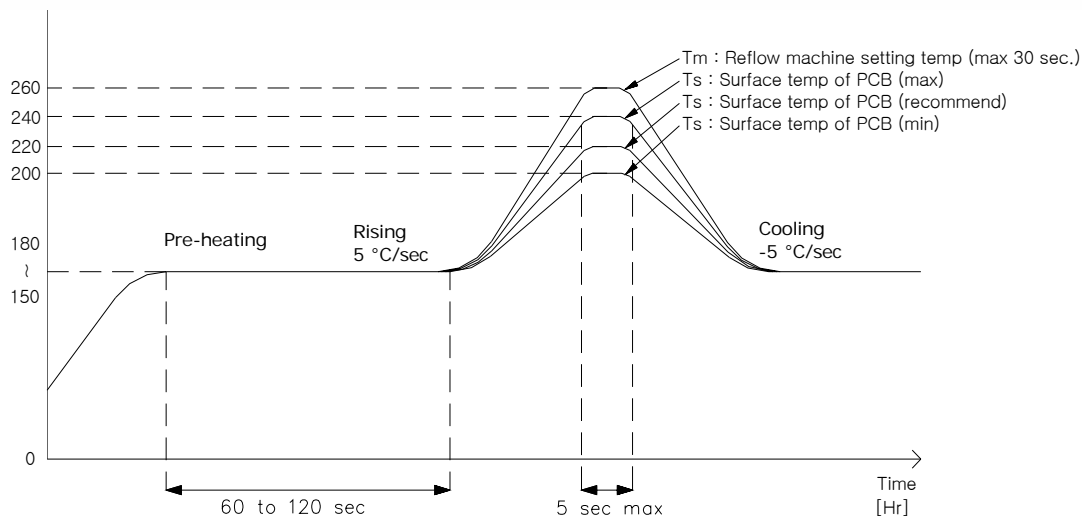
2.All dimensions are in millimeters (tolerance : ± 0.2)

3.Scale none

* The appearance and specifications of the product may be changed for improvement without notice.

Soldering Profile (Ta=25°C)

1. Reflow Soldering Conditions / Profile



2. Hand Soldering conditions

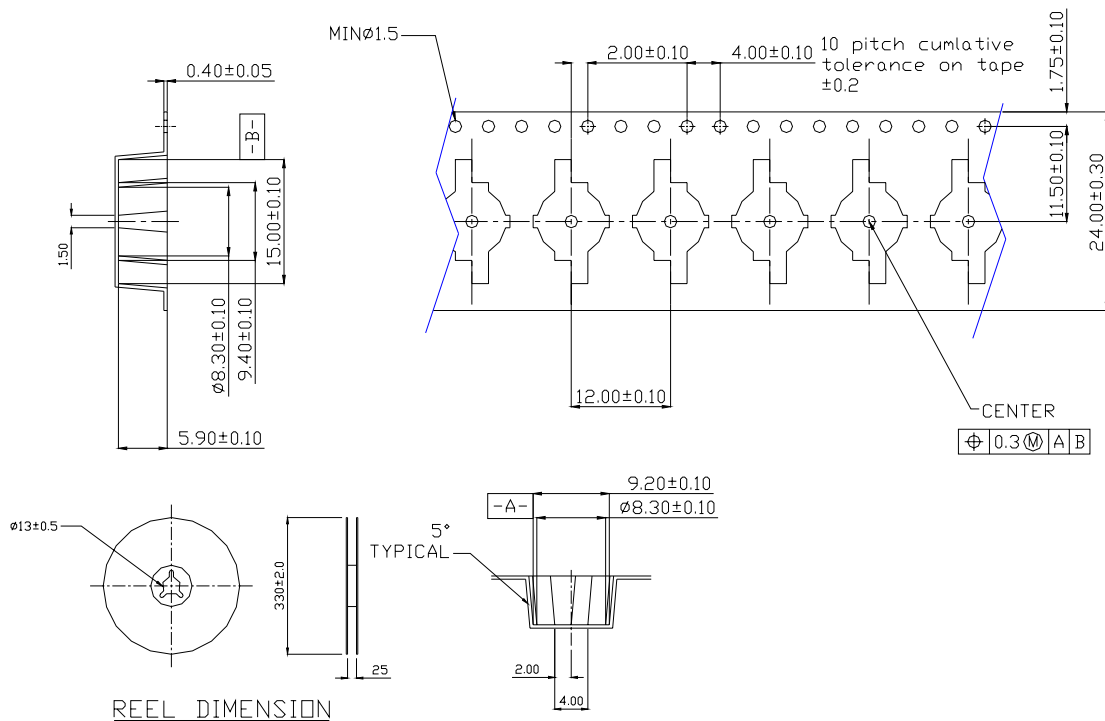
Lead : Not more than 3 seconds @MAX280°C

Slug : Use a thermal-adhesives

* Caution

1. Reflow soldering should not be done more than one time.
2. Repairing should not be done after the LEDs have been soldered.
When repairing is unavoidable, suitable tools have to 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.

Emitter Reel Packaging



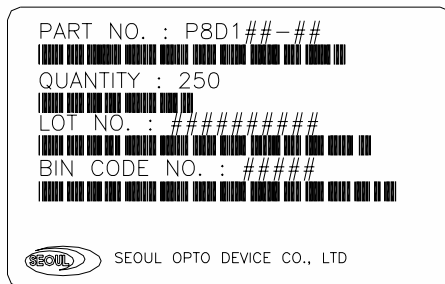
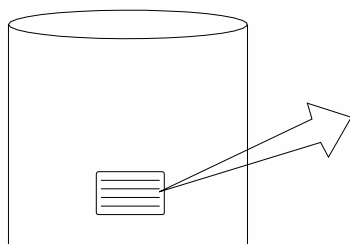
Note :

1. The number of loaded products in a reel is 250ea.
2. All dimensions are in millimeters.
3. Scale none

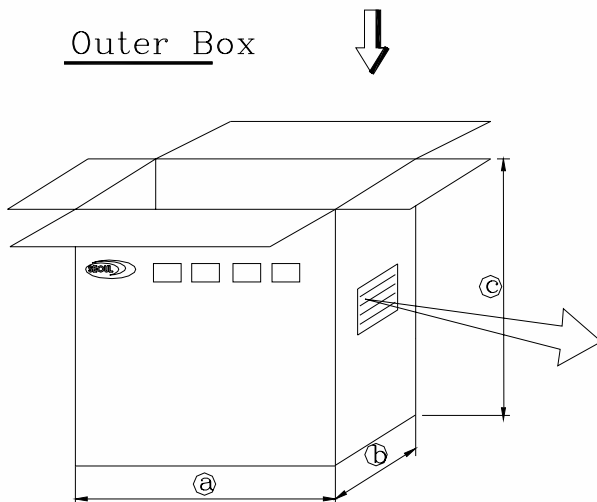
*The appearance and specifications of the product may be changed for improvement without notice.

Packaging Structure

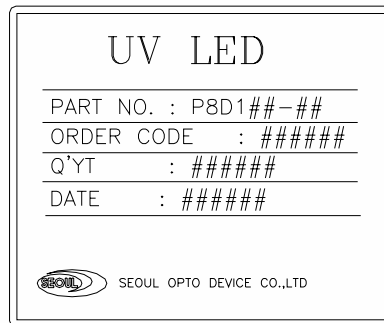
Aluminum Vinyl Bag



Outer Box



TYPE	SIZE(mm)		
	a	b	c
	350	350	370



Note :

1. 6~10 reels are loaded in a box.
2. Scale none

Precaution for Use

1. Caution

- The devices are UV LEDs. During the operation, The UV LED radiates UV light, which precaution 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. If there is a possibility to receive the reflection of UV light, protect by using the UV light protective glasses so that UV light should not catch one's eye directly.



2. Storage

- To avoid the moisture penetration, we recommend storing Power LEDs in a dry box (or desiccator) with a desiccant . The recommended storage conditions are Temperature 5 to 30 degrees Centigrade. Humidity 50% maximum.

3. Precaution after opening packaging

- However LED is correspond SMD, when LED be soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop.

Attention in followed.

- Soldering should be done right after opening the package(within 24Hrs).
 - Keeping of a fraction
 - Sealing
 - Temperature : 5 ~ 40℃ Humidity : less than 30%
 - If the package has been opened more than 1week or the color of desiccant changes, components should be dried for 10-12hr at 60±5℃
- Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temp. after soldering.
 - Please avoid rapid cooling after soldering.

- Components should not be mounted on warped direction of PCB.
- Anti radioactive ray design is not considered for the products listed here in.
- Gallium arsenide is used in some of the products listed in this publication. These products are dangerous if they are burned or shredded in the process of disposal. It is also dangerous to drink the liquid or inhale the gas generated by such products when chemically disposed.
- This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When washing is required, IPA(Isopropyl Alcohol) should be used.
- When the LEDs are illuminating, operating current should be decided after considering the package maximum temperature.
- LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from SOC, a sealed container with a nitrogen atmosphere should be used for storage.
- The appearance and specifications of the product may be modified for improvement without notice.
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- The slug is connected to the anode. Therefore, we recommend to isolate the heat sink.

Handling of Silicone resin LEDs

Power UV LED is encapsulated by silicone resin for the highest flux efficiency.

Notes for handling of Silicone resin Power UV LEDs

- Avoid touching silicone resin parts especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on silicone resin parts.
- Please store the LEDs away from dusty areas or seal the product against dust.
- When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.
- Please do not use a force of over 3000 gf impact or pressure diagonally on the silicon lens. This may cause a catastrophic failure.
- Please do not mold over the silicone lens with another resin.
(epoxy, urethane, etc)