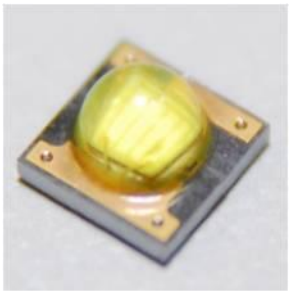
3535 UV Series 1W~3W



The 3535 LED from Sunview Opto brings industry leading technology to the UV lighting market with its high quality and performance. With a ceramic substrate, 3535 from Sunview Opto feature very high brightness and efficacy, as well as excellent life time.

Features

- Low thermal resistance
- Instant response
- Fully dimmable
- Superior ESD protection
- Lead free reflow solder JEDEC 020c compatiable
- RoHS compliant

Applications

- UV Curing
- Counterfeit currency

Product Nomenclature

TR - 3535 - C 1 L U

X1 X2 X3 X4 X5 X6

X1 Packing

Code	Type
TR	Reel

X2 Module

Code	Type
3535	XPE 3.45x3.45mm

X3 Materials

Code	Type
C	Ceramic

X4 Power

Code	Type
1	operation@350mA
2	test@350mA operation@700mA

X5 Lens

Code	Type
L	Lambertian

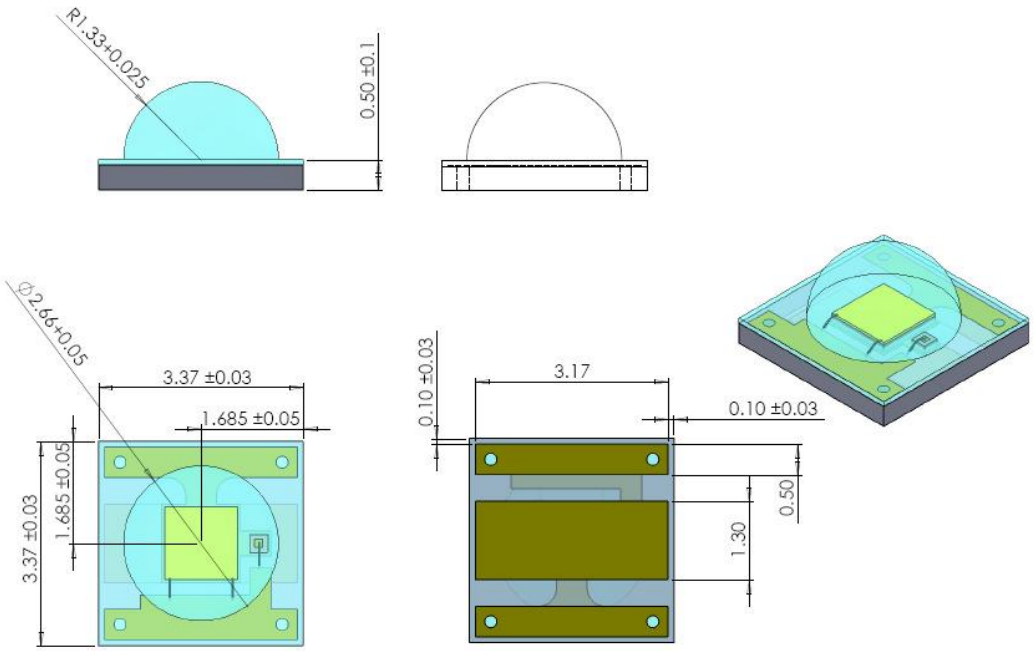
X2 Color

Code	Type
U	UV

Part Number Matrix of 3535 XPE UV Series

Color	Part Number	Radiation Pattern
UV 375-410 nm	TR-3535-C1LU	Lambertian

Pad configuration



Solder Pad Design

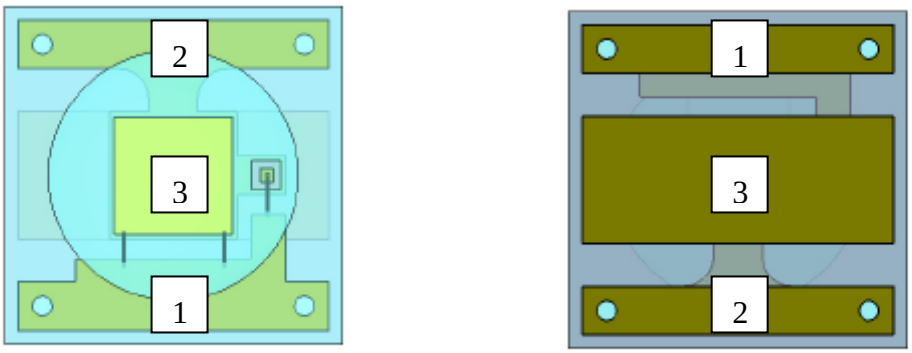
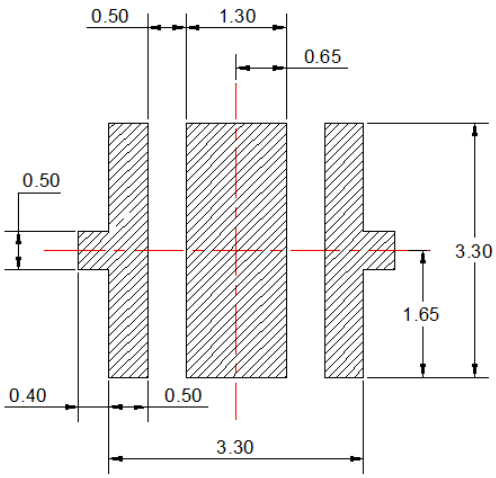


Figure. Pad configuration

Pad	Function
1	Cathode
2	Anode
3	Thermal



Note:

1. Drawings are not to scale.
2. All dimensions are all in millimeter.
3. All dimensions without tolerance are for reference only.
4. Specifications are subject to change without notice.

Absolute Maximum Ratings

Parameter	UV Series
Peak Forward Current (1/10 Duty Cycle at 1KHz)	1000mA
Continuous Forward Current	350 – 700mA
LED Junction Temperature	125℃
Operation Temperature	-40℃ ~+85℃
Storage Temperature	-40℃ ~+110℃
Reverse Voltage (V)	not designed for reverse operation

Luminous Flux Characteristics

Radiation Power(mW) Characteristics at Test Current, Junction Temperature at 25℃ ;

3535 Vf = 3.4V ,If=350mA Pre LED.

Color	Part Number	Radiation Power (mW) (1)			Remark
		Min	Type	Max	
UV-375-380nm	TR-3535-C1LU	220	260	--	(350mA)
UV-380-385nm	TR-3535-C1LU	300	340	--	(350mA)
UV-385-390nm	TR-3535-C1LU	300	340	--	(350mA)
UV-390-395nm	TR-3535-C1LU	360	420	--	(350mA)
UV-395-400nm	TR-3535-C1LU	360	420	--	(350mA)
UV-400-405nm	TR-3535-C1LU	380	420	--	(350mA)
UV-405-410nm	TR-3535-C1LU	400	440	--	(350mA)

Notes:

1. The radiation power is measured with an accuracy of ±10%
2. Minimum and maximum value refers to the limits and set up of Sunview Opto testers. All other Measurement data are defined as long-term production mean values and are only given for reference.
3. A critical component is a component used in a life-support device or system whose failure can Reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system. Life support devices or systems are intended (i) to be implanted in the human body, or (ii) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered. Components used as a critical component must be approved in writing by Sunview Opto.
4. These devices emit high intensity UV/3535 light. Necessary precautions must be taken during operation. Do not look directly into the light or look through the optical system when in operation. Protective eyewear should be worn at all times during operation.
5. Lens discoloration may occur with prolonged exposure to UV/3535 light. Lens material will need to be tested for UV/3535 light compatibility and durability.
6. Always follow thermal design recommendations in this document.

Optical Characteristics

Optical Characteristics at Test Current, Junction Temperature at 25℃

Color	Typical View Angle (Degrees)
	$2\Theta_{1/2}$(1)
UV	140

Note:

1. $\Theta_{1/2}$ is the off axis angle from emitter centerline where the radiometric intensity is 1/2 of the peak value.

Electrical Characteristics

Electrical Characteristics at Test Current 350mA Pre LED, Junction Temperature at 25℃

3535 LED.

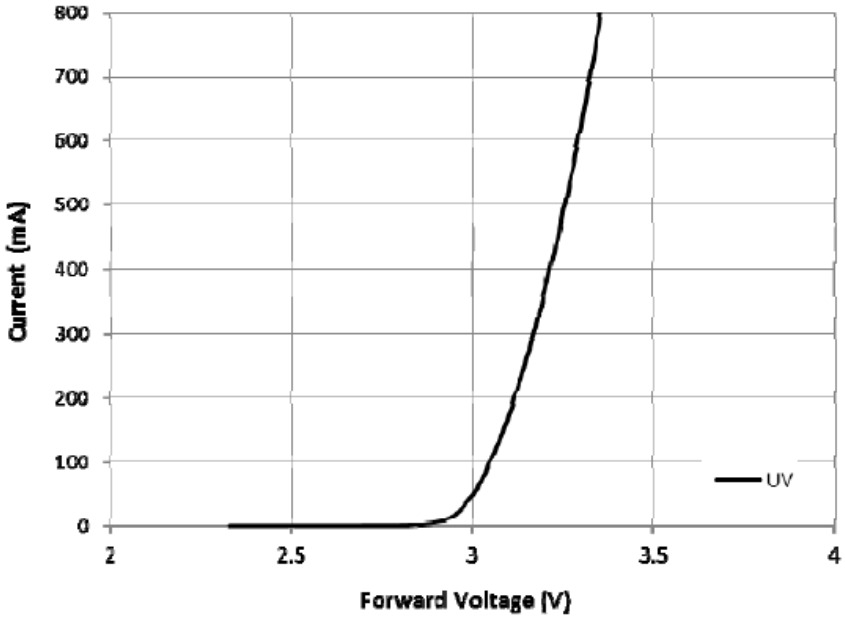
Wavelength	Forward Voltage V_F(1) (V)			Typical Temperature Coefficient of Forward Voltage (mV/℃)	Typical Thermal Resistance Junction to Case (℃/W)
	Min	Type	Max	$\Delta V_F / \Delta T$(2)	$R\theta_{J-C}$
375-380nm	3.0	--	4.0	-2~-4	11
380-385nm	3.0	--	4.0	-2~-4	11
385-390nm	3.0	--	4.0	-2~-4	11
390-395nm	3.0	--	4.0	-2~-4	11
395-400nm	3.0	--	4.0	-2~-4	11
400-405nm	3.0	--	4.0	-2~-4	11
405-410nm	3.0	--	4.0	-2~-4	11

Note:

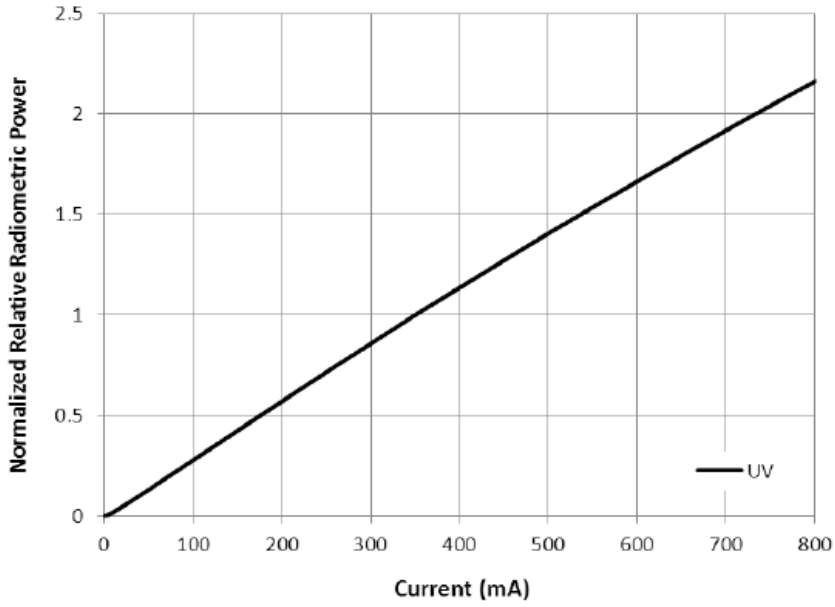
1. Sunview maintains a tolerance of ±0.1V on forward voltage measurements.
2. The temperature coefficients of forward voltage are measured between T_j=30 and T_j=120.

Typical Electrical Characteristicsm Tj=25℃

The following graph represents typical performance of each LED die in the 3535 LED.

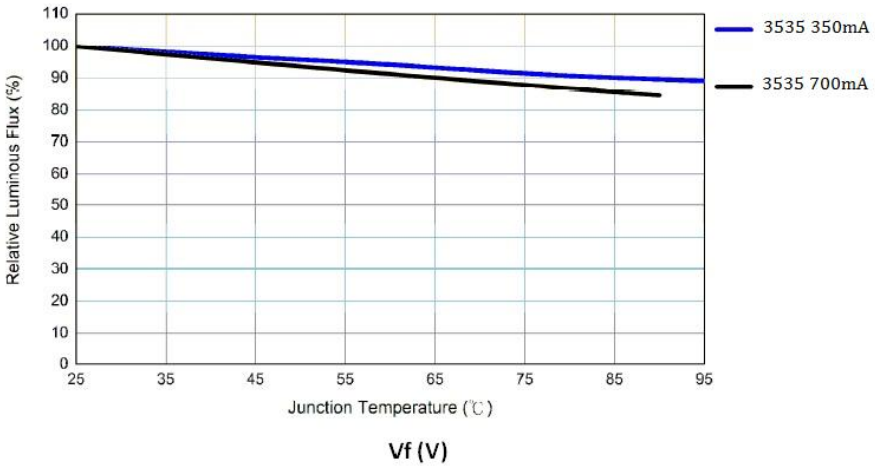


The following graph represents typical performance of each LED die in the 3535 LED.



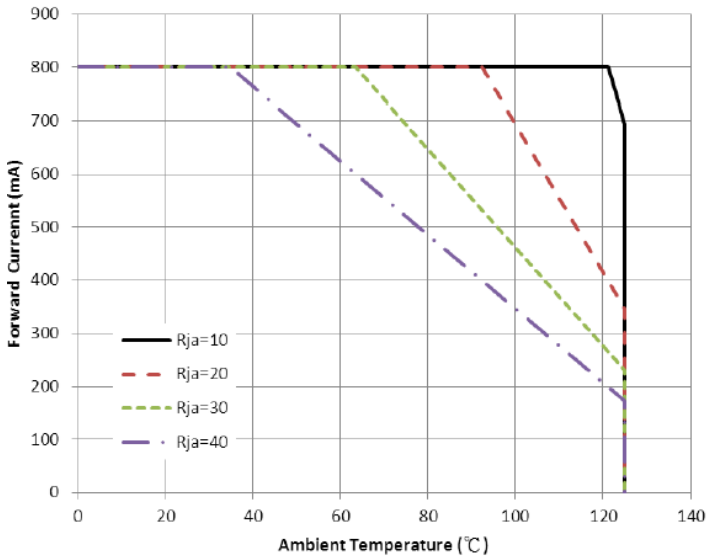
Typical Power Output Characteristics over Temperature

Typical Relative Radiation Power Luminous Flux V.S. Juction Temperature



Vf (V)

Typical Relative Radiation Power Luminous Flux V.S. Pad Temperature



The junction temperature can be correlated to the thermal resistance between the junction and ambient (Rja) by the following equation.

Tj=Ta + Rja*W

Tj: LED junction temperature

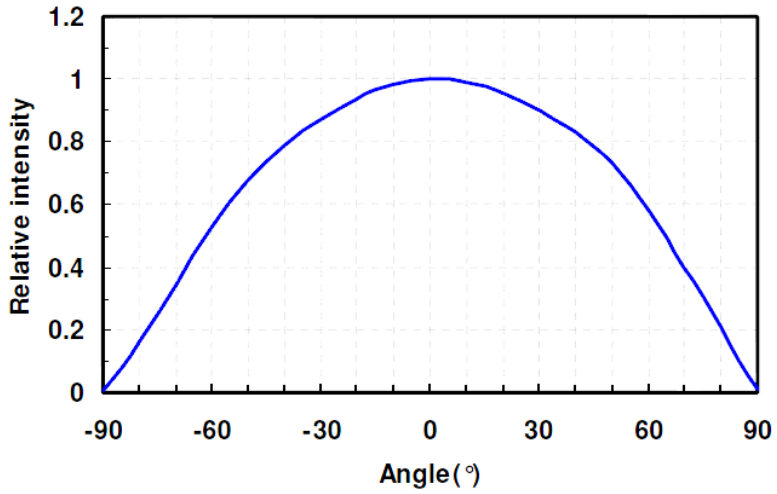
Ta: Ambient temperature

Rja: Thermal resistance between the junction and ambient

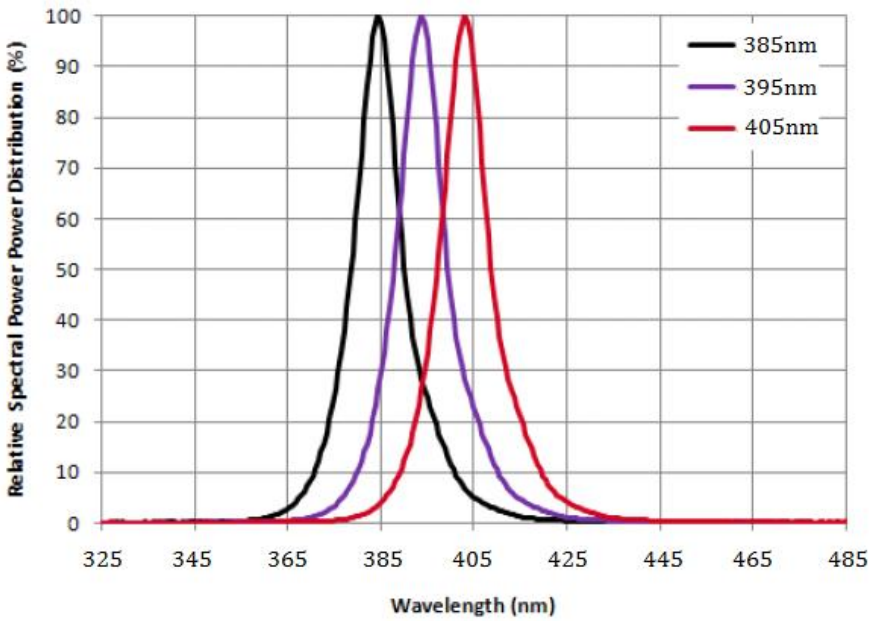
W: Input power (IF*VF)

Typical Radiation Patterns

Typical Representative Spatial Radiation Patterns



Relative Spectral Power Distribution, Tj=25℃



Product Binning

3535 series are labeled with four alphanumeric codes. The formats are explained as follows:

A BC DE

A = Peak Wavelength (D, H etc.)

BC = Radiation Power (mW) bin (26, 36 etc.)

DE = Voltage bin (32,36 etc.)

Peak Wavelength Bin Structure (A)

Code	Min. Wp(nm)	Max. Wp (nm)
D	375	380
E	380	385
F	385	390
G	390	395
H	395	400
I	400	405
J	405	410
K	410	415
L	415	420

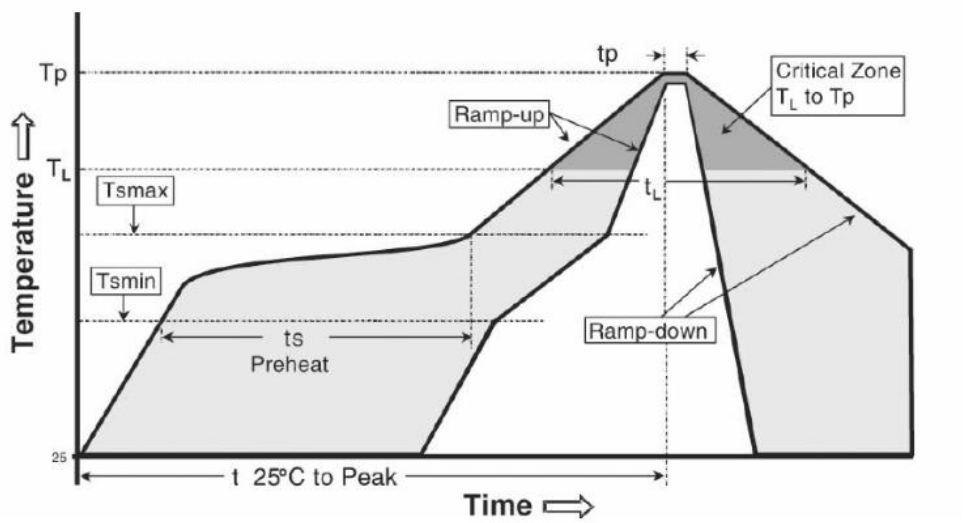
Radiation Power (mW) Bin Structure (BC)

Code	Min. Power (mW)	Max. Power (mW)
20	200	220
22	220	240
24	240	260
26	260	280
28	280	300
30	300	320
32	320	340
34	340	360
36	360	380
38	380	400
40	400	440
44	440	480
48	480	520
52	520	560
60	600	640

Voltage Bin Structure (DE)

Code	Min. Volt(Vf)	Max. Volt(Vf)
30	3.0	3.2
32	3.2	3.4
34	3.4	3.6
36	3.6	3.8
38	3.8	4.0

Reflow soldering conditions



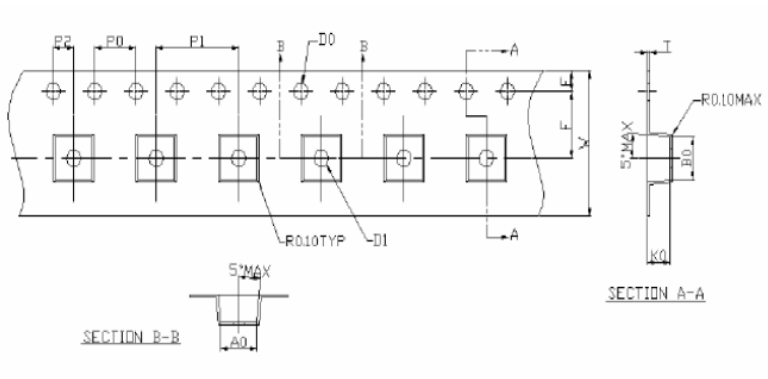
The LEDs can be soldered using the parameters listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest possible temperature is preferred for the LEDs.

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (Tsmax 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 (T_L) - Time (t_L)	 183 °C 60-150 seconds	 217 °C 60-150 seconds
Peak Temperature (Tp)	215 °C	260 °C
Time within 5°C of actual Peak Temperature $(tp)^2$	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.

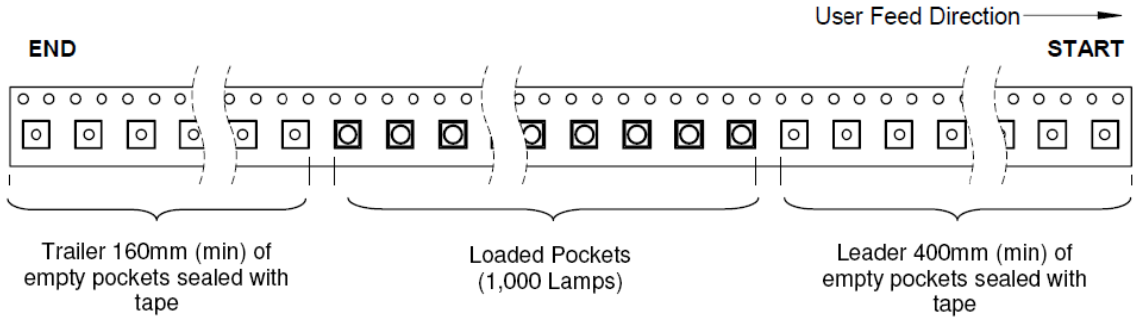
Note:

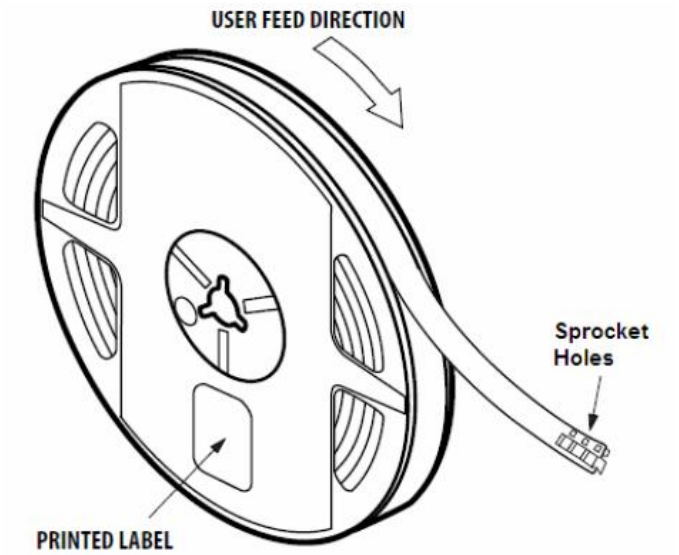
1. Please avoid solder ball or excessive solder around side wall during SMT process. Excessive solder may cause a short circuit.

Tape and Reel

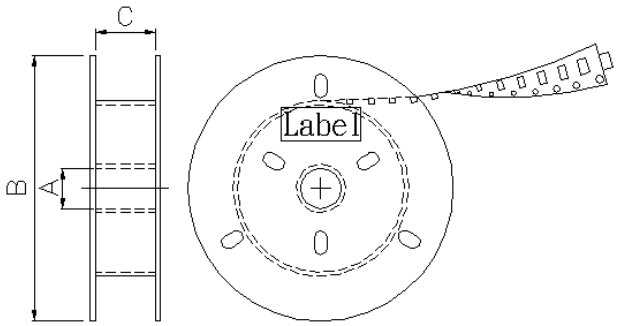


Item	Specification	Tol. (+/-)
W	12.00	± 0.30
E	1.75	± 0.10
F	5.50	± 0.10
D0	1.50	+0.10, -0
D1	1.50	± 0.10
P0	4.00	± 0.10
P1	8.00	± 0.10
P2	2.00	± 0.10
P0 x 10	40.00	± 0.20
t	0.30	± 0.05
A0	3.80	± 0.10
B0	3.80	± 0.10
K0	2.20	± 0.10





Tape and Reel Package Specifications, Continued



Item	Dimension (mm)
A	60
B	178
C	12
Inner Carton	200 x 215 x 40

Note:

1. There are 1000pcs emitters in a reel.
2. An antistatic bag contains 1000pcs emitters and a drying agent.
3. There is 1 reel in an inner carton.

Reliability Test

No.	Test Item	Standard Test Method	Test Conditions	Note	Sample Size	Pass
1	Steady State Operating Life	Internal Ref.	If = 350 mA	1000 Hrs	20	OK
2	Thermal Shock	JESD22-A106-A	-40°C ~ 100°C	300 Cycles	50	OK
3	Temperature Cycle	JESD22-A104-A	-40°C ~ 100°C	300 Cycles	50	OK
4	High Temperature Storage	JESD22-A103-A	85°C	1000 Hrs	20	OK
5	Low Temperature Storage	Internal Ref.	-40°C	1000 Hrs	20	OK
6	High Temperature High Humidity	JESD22-A101-B	60°C,90%RH	1000 Hrs	20	OK
7.	On-off test	Internal Ref.	2 sec on -2 sec off	100,000 cycle	20	OK

Cautions:

1. After open the package, the LED should be kept at 30°C, 60%RH or less. The LED should be soldered within 168 hours (7 days) after opening the package.

2. Heat generation must be taken into the design consideration when using the LED.

3. Power must be applied resistors for protection, over current would cause the optic damage and wavelength shift to the devices.

4. Manual tip solder may cause the damage to chip devices, so advised that heat of iron should be lower than 15W with temperature control under 5 seconds at 230-260 deg. C. (The device would be got damage in re-working process, recommended under 5 seconds at 230-260 deg. C)

5. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handing the LED, or should be installed the ionizer if the risk of generation area would be high.

6. Use IPA as a solvent for cleaning the LED. The other solvent may dissolve the LED package and the epoxy, Ultrasonic cleaning should not be done.

7. Damaged LED will show unusual characteristics such as leak current remarkably increasing, turn-on voltage becomes lower and the LED get unlighted at low currents.

- This UV LED during operation radiates intense UV light.
- Do not look directly into the UV light during operation of device. This can be harmful to the eyes even for brief period due to the intense UV light.
- If viewing the UV light is necessary, please use UV filtered glasses to avoid damage by the UV light.
- Please affix a caution label to your product to that effect, if the UV LED in your product might be viewed directly,
- Avoid direct eye exposure to UV light.
- Keep out of reach of children.