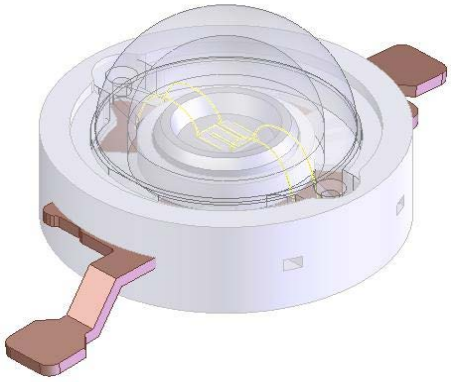
台宙晶體科技股份有限公司
Top Crystal Technology Inc.,

Power Light Source

Introduction：

TCI infrared emitter is one the highest flux LEDs in the world. Due to the special design of chip and package, the TCI infrared emitter is designed by particular package for high power LED.

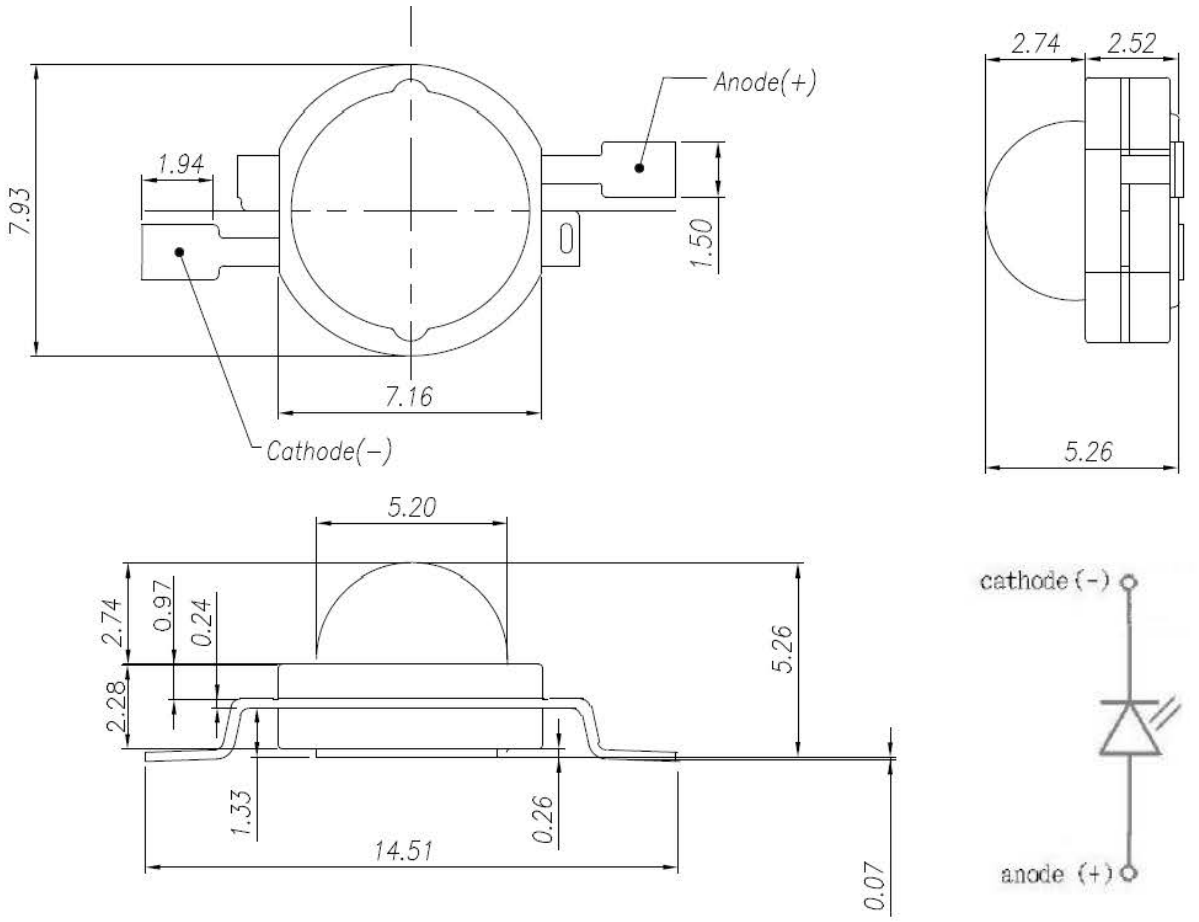


Feature：

- Long operating life
- Energy efficiency
- Low thermal resistance
- Compact design
- Instant light
- Fully dimmable
- Superior ESD protection
- ROHS compatibility

Typical Applications:

- CCTV
- Wireless communication



Notes：

1. Drawings are not to scale.
2. All dimensions are in millimeter.
3. General tolerance is ±0.2mm.
4. The polarity of slug at bottom is anode.
5. It is important that the slug can't contact aluminum surface, it is strongly recommended that there should coat a uniform electrically isolated heat dissipation film on the surface.
6. It is strongly recommended that the temperature of lead be not higher than 55℃.

Absolute Maximum Ratings

Parameter	Maximum Ratings
DC Forward Current (mA)	700
Peak Pulse Current (mA) (1/10 Duty Cycle at 1KHz)	800
LED Junction Temperature (℃)	120
Operating Temperature (℃)	-30~100
Storage Temperature (℃)	-40~120
Soldering Temperature	JEDEC 020c 250℃ 5 seconds
Reverse Voltage	Not design to be driven in reverse bias
ESD Sensitivity	> 8,000V Human Body Model (HBM)

Optical Characteristics@700mA (Tj=25℃)

Color	Peak Wavelength λp		Viewing Angle Degree
	Min.	Max.	2θ1/2
Infrared 730	720nm	740nm	135
Infrared 850	840nm	870nm	135
Infrared 940	930nm	960nm	135

Notes :

1. CCT ±5% tester tolerance.
2. Wavelength is measured with an accuracy of ±0.5nm.

Flux Characteristics (Tj=25℃)

Color	Forward current	Part Number	Minimum Luminous Flux(mW)	Typical Luminous Flux(mW)	Maximum Luminous Flux(mW)	Beam Pattern
Infrared 730	700mA	THEM-DLI	400mW	450mW	--	Lambertian
Infrared 850	700mA	THEM-DLI	420mW	500mW	--	
	1000mA	THEM-ELI	600mW	700mW	--	
Infrared 940	1000mA	THEM-ELI	500mW	630mW	--	

- TCI maintains a tolerance of ±7% on flux and power measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

Electrical Characteristics (Tj=25℃)

Color	Forward current	Part Number	Forward Voltage V_F(V) Min.	Typ.	Max.	Temperature Coefficient of V_F(mV/℃) $\Delta V_F/\Delta Tj$	Thermal Resistance Junction to lead (℃/W)
Infrared 730	700mA	THEM-DLI	1.75	2.1	2.5	-2	10
Infrared 850	700mA	THEM-DLI	1.5	1.8	2.0	-2	10
	1000mA	THEM-ELI	1.6	1.8	2.2	-2	10
Infrared 940	1000mA	THEM-ELI	1.5	1.8	2.2	-2	10

Notes:

1. V_F ±0.1V tester tolerance.

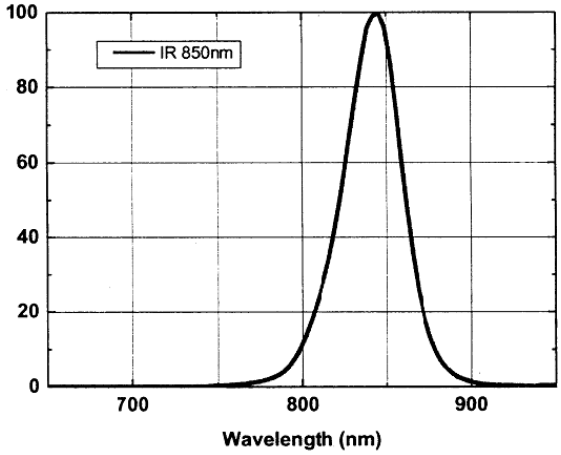
RELIABILITY ITEMS and SPECTIONS

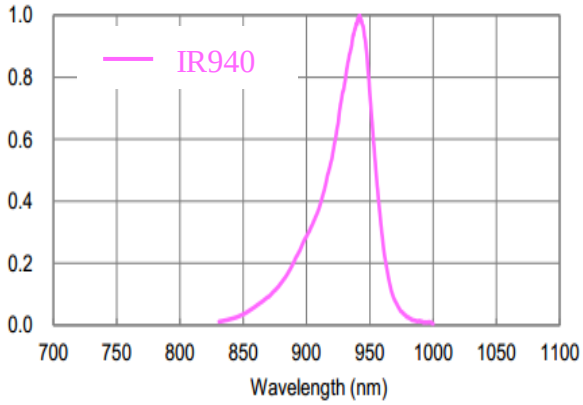
No	Test Item	Test Conditions	Remark
1	Room Temperature Operating Life	25℃	1000 hrs
2	High Temperature Storage	Temperature：110℃	1000 hrs
3	Thermal shock	-40°C to 120°C, 20 min. dwell, <20 sec. transfer	200 cycles
4	High Temperature，High Humidity Storage	85°C/85%RH	1000 hrs
5	Low Temperature Storage	- 40℃	1000 hrs
6	Solderability	Tp = 260°C for 5 sec	3 times
7	Drop test	120 cm height，fall freely onto stainless board	3 times
8	Temperature Cycle (TMCL)	-40°C to 120°C, 30 min. dwell, <5 min. transfer	200 cycles

Failure Criteria：

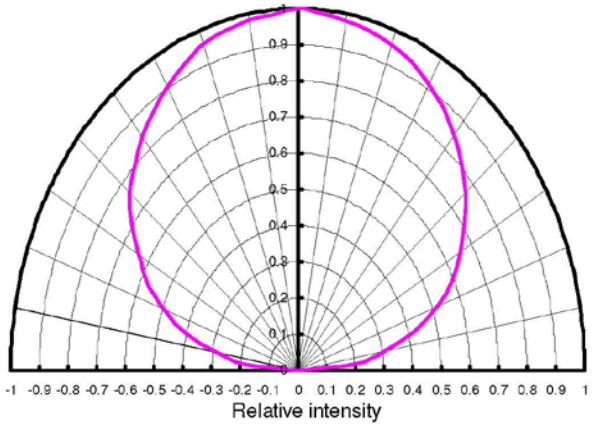
1. Forward Voltage (VF) ≧ Initial Level x 1.1
2. Luminous Flux or Radiometric Power (ΦV) ≦ Initial Level x 0.7
3. Reverse Current (IR) ≧ 10μA
4. Resistance to Soldering Heat：No deaqd lamps or visual damage.

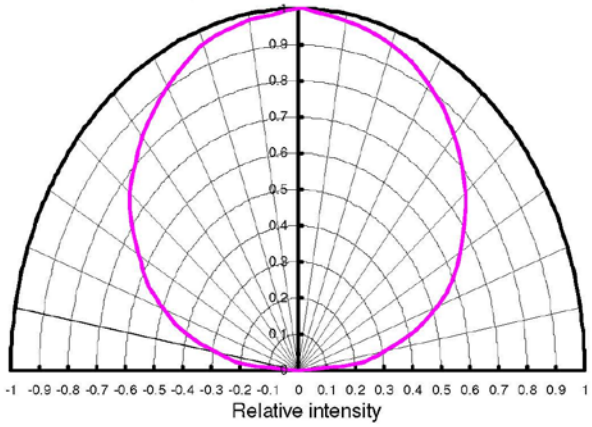
Wavelength Spectrum, Ta=25℃



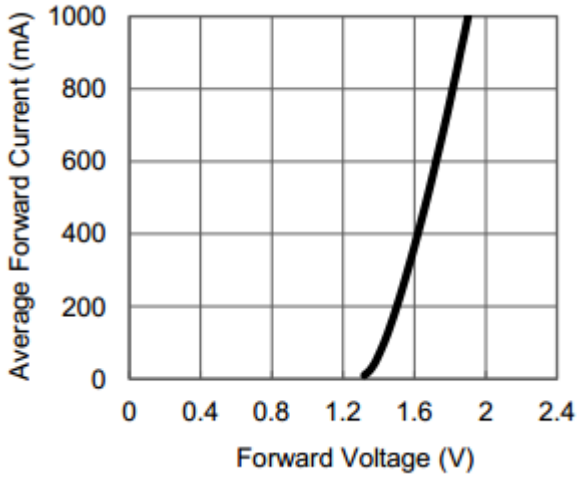


Typical Polar Radiation Pattern

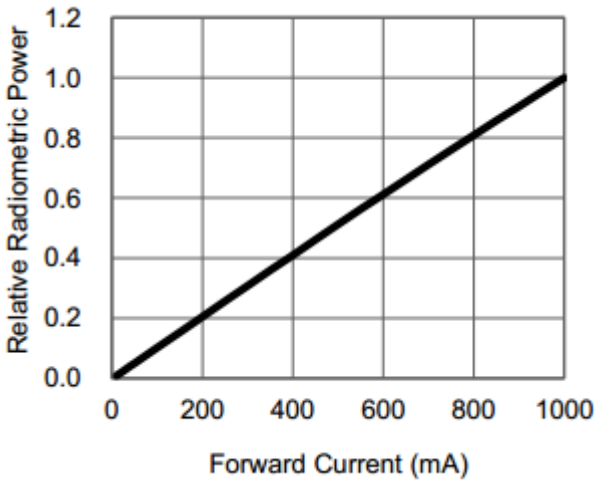




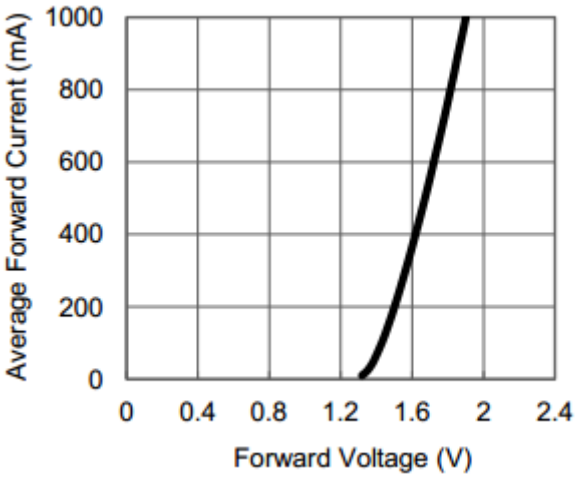
Forward Voltage vs Forward Current

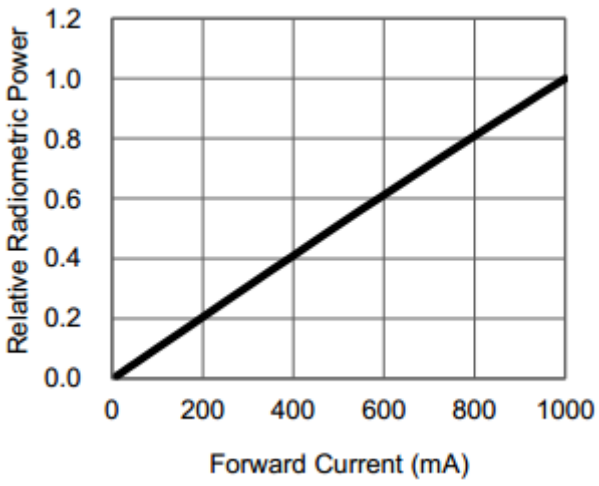


Relative intensity vs. Forward Current



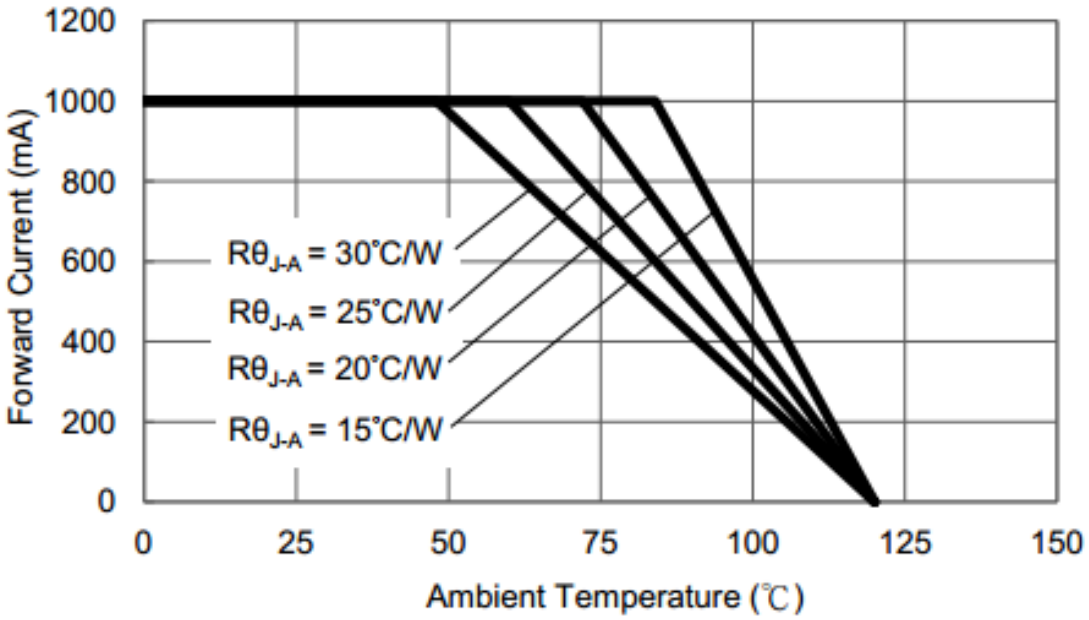
Infrared 850



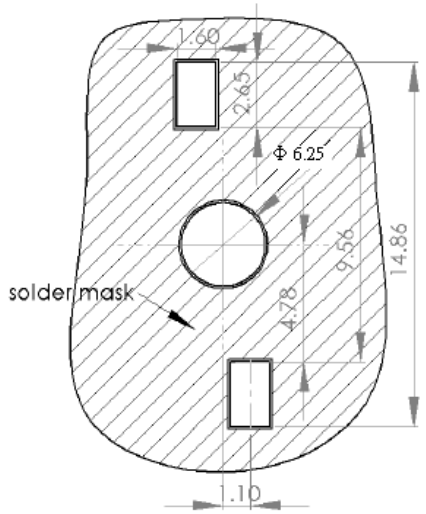


Infrared 940

Ambient Temperature vs. Maximum Forward Current



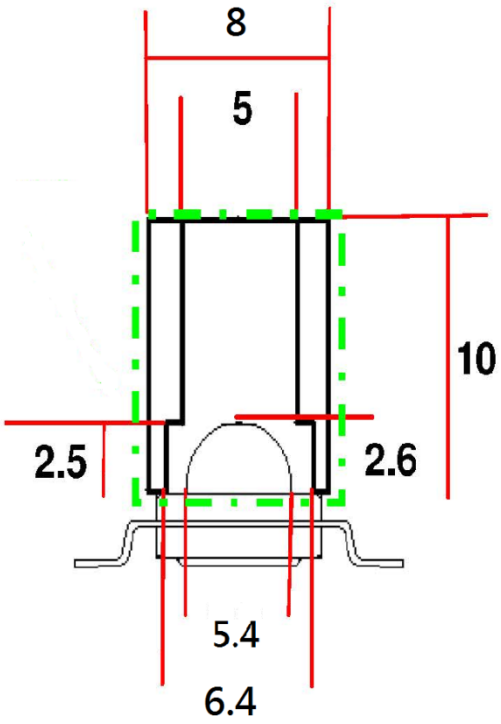
5. Recommended Solder Pad Design

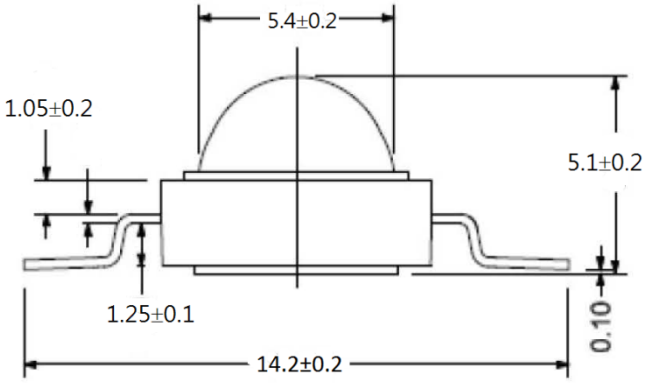


Notes :

1. Drawing is not to scale
2. All dimensions are in millimeter
3. Solder pad can't be connected to slug

6. Recommended nozzle style

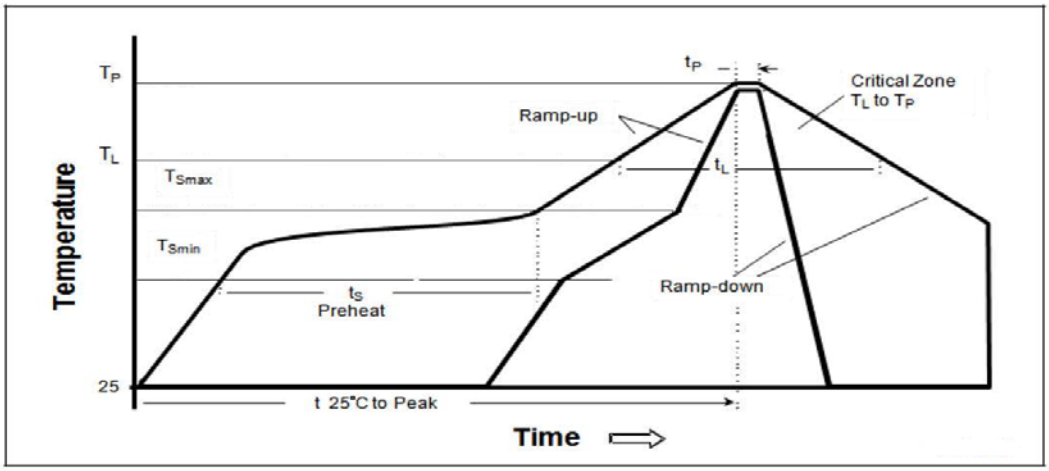




(the inner diameter of the nozzle the untouchable moliding colloidal)

Recommended Soldering Profile

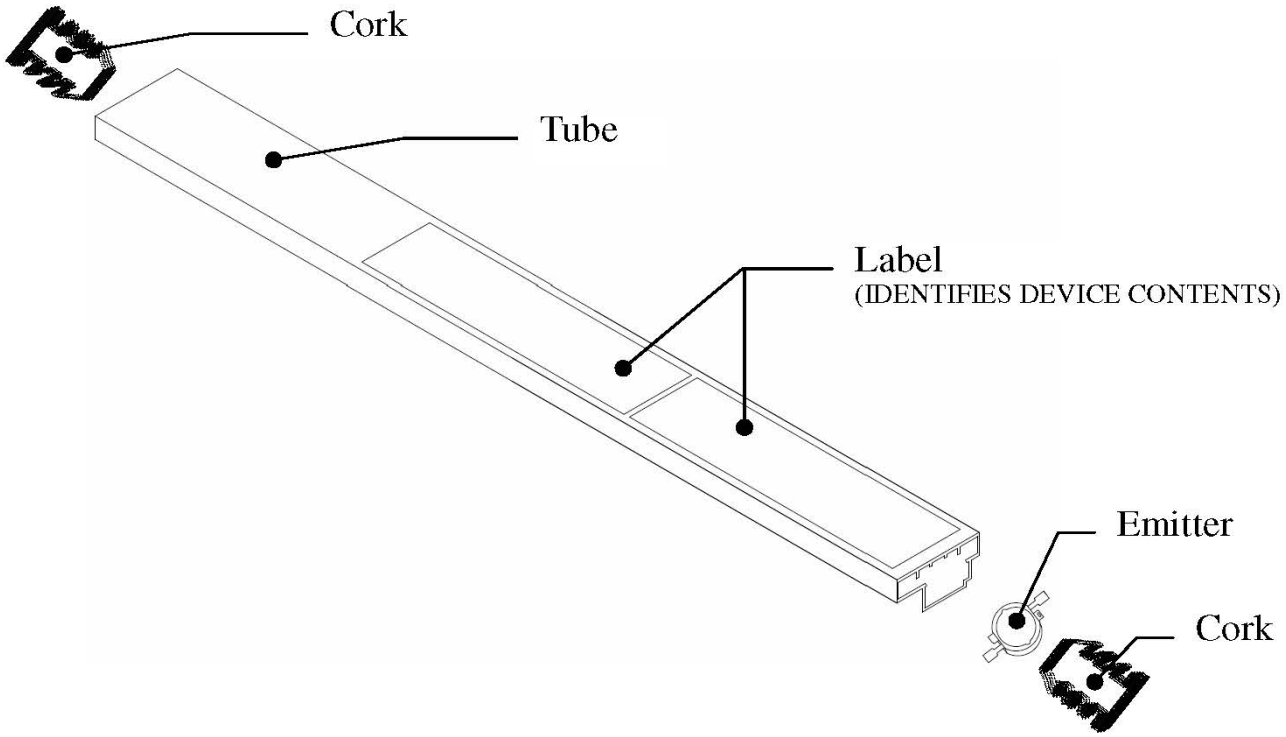
The LEDs can be soldered using the parameter listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest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

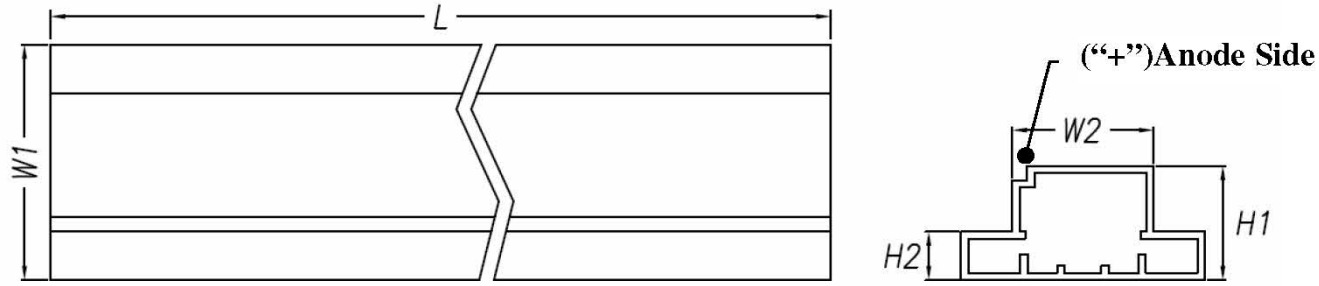


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate (T_{Smax} to T_P)	3℃ / second max.	3℃ / second max.
Preheat – Temperature Min (T_{Smin}) – Temperature Max (T_{Smax}) – Time (t_{Smin} to t_{Smax})	 100℃ 150℃ 60-120 seconds	 150℃ 200℃ 60-180 seconds
Time maintained above: – Temperature (T_L) – Time (t_L)	 183℃ 60-150 seconds	 190℃ 60-150 seconds
Peak/Classification Temperature (T_P)	230℃	250℃
Time Within 5℃ of Actual Peak Temperature (t_P)	5 seconds	5 seconds
Ramp-Down Rate	6℃/second max.	6℃/second max.
Time 25℃ to Peak Temperature	6 minutes max.	8 minutes max.

- All temperatures refer to topside of the package, measured on the package body surface.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than three times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

Tube Package Specifications





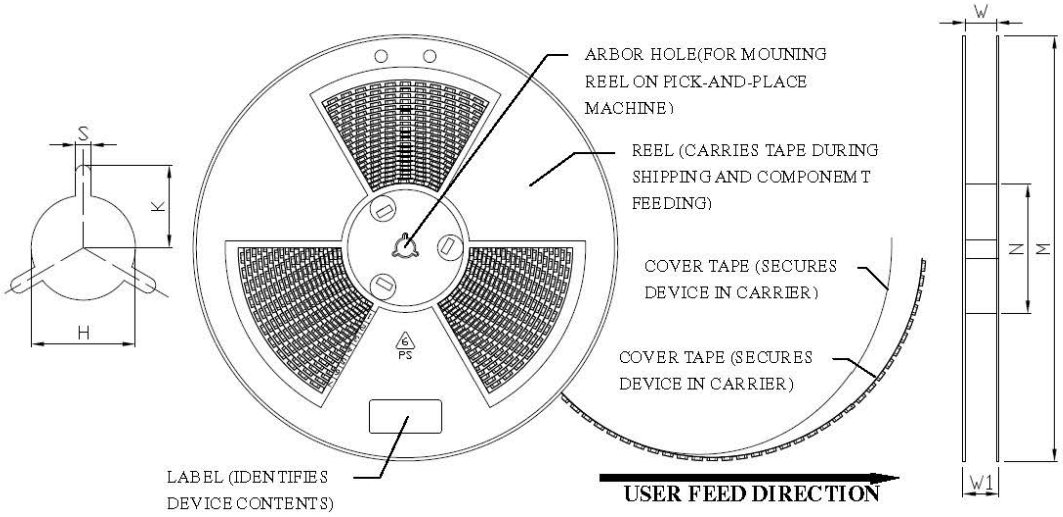
Unit：mm

W1	W2	H1	H2	L
16.5	9.6	8	3.4	424

Notes

1. There are 50pcs emitters in a tube.

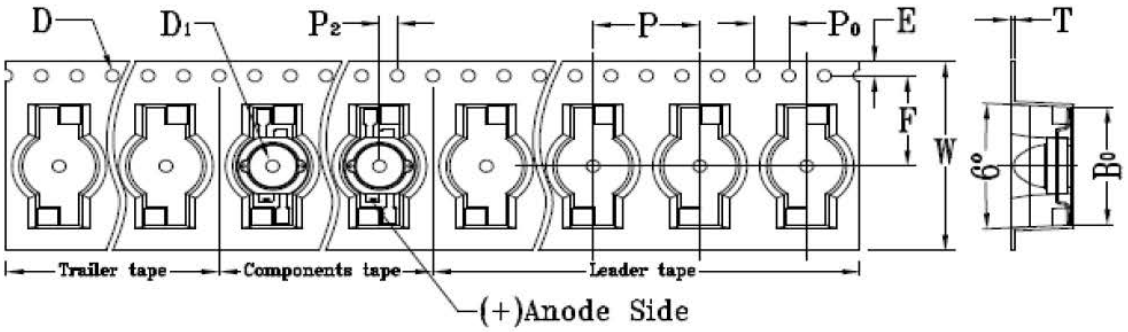
Tape and Reel Packaging Specifications



Unit：mm

M	N	W	W1	H	K	S
Φ330.0	Φ99.5	24.4	29	Φ13.5	10.75	2.5
±1.0	±1.0	±1.0	±1.0	±0.5	±0.5	±0.5

Carrier tape dimensions



Unit：mm

W	P	E	F	P_2	D	D_1	P_0	A_0	B_0	K_0	T
24.0	12.0	1.75	11.5	2.0	1.5	1.5	4.0	8.2	15.0	6.7	0.4
±0.3	±0.1	±0.1	±0.1	±0.1	±0.1	±0.25	±0.1	±0.1	±0.1	±0.1	±0.05

Notice

1. Unavailable directly touch the colloid surface and squeeze
2. Use tweezers to pick up the external sides of the housing part carefully. Do not grab, puncture or push the emitting region. Over stress on the lens may cause the gamage of component and raise the risk to break the wire inside the package.
3. In order to avoid absorption of moisture, it is recommended that the products are stored in the dry box (or desiccators) with a desiccants. Alternatively the following environment is recommended: Storage temperature : 5°C~30°C Humidity:60% HR max.
4. If the storage conditions are of high humidity the product should be dried before use. Recommended drying conditions: 12 hours at 60°C±5°C
5. Any mechanical force or any excess vibration should be avoid during the cooling process after soldering.
6. Reflow rapidly cooling should be avoided.
7. Components should not be mounted on distorted Printed Circuit Boards.
8. Devices should not contact with any types of fluid, such as water , oil , organic solvents…. etc.
9. The maximum ambient temperature should be taken into consideration when determining the operating current.