SEMILEDS

PRODUCT DATASHEET

P2000U-UNN1

High Power UV LED

Introduction

P2000U-UNN1 provides high radiometric power output with high efficiency. It is capable of standard lead free solder reflow process. P2000U-UNN1 series is suitable for counterfeit currency detection, defect detection, medical treatment and other general purpose UV applications.

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RoHS Compliant

Characteristics

Absolute Maximum Ratings (T_j = 25°C)

Parameter	Rating
	UV Series
DC Forward Current	700 mA
Pulse Forward Current [1]	1000 mA
LED Junction Temperature	150°C
LED Operating Temperature	-40°C ~ 85°C
Storage Temperature	-40°C ~ 110°C
Soldering Temperature	Max. 240℃ / Max. 20sec. (JEDEC 020c)
ESD Sensitivity	2,000 V HBM (JESD-22A-114-B)
Reverse Voltage	Not designed to be driven in reverse bias (VR≦5V)
Preconditioning	Acc. to JEDEC Level 2

Notes: [1] IFP Condition: Pulse width ≦ 10msec. and duty ≦ 1/10.

General Characteristics at 350mA

Part number	Color	Peak Wavelength λp		$2\theta_{1/2}$	Temperature Coefficient of Vf (mV/°C)	Thermal Resistance Junction to Pad (°C/W)
		Min	Max		ΔVF /ΔTJ	$R\Theta_{J-L}$
P2000U-UNN1-A1G11H-	U50	390	400	140	-2~-4	10
	U60	400	410	140	-2~-4	10
	U70	410	420	140	-2~-4	10

Notes: The peak wavelength is measured with an accuracy of ±1nm

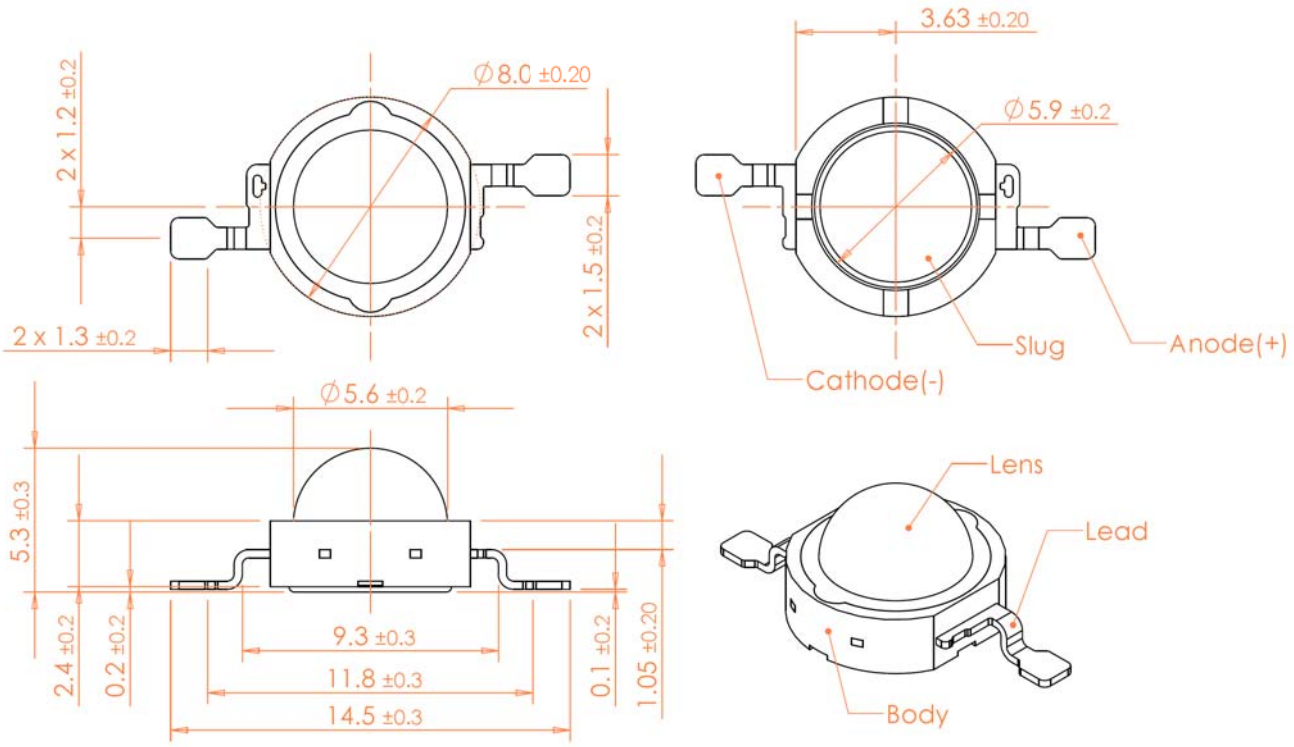
Radiometric Power and Forward Voltage (T_j = 25°C)

Part number	Color	Performance at Test Current (350mA)					Performance at 700mA
		Group	Radiometric Power (mW)		VF		* Calculated Minimum Radiometric Power (mW)
			Min	Max	Min	Max	
P2000U-UNN1-A1G11H-	U50 (390-400nm)	PD5	360	400	3	4	610
		PE1	400	440	3	4	680
		PE2	440	480	3	4	750
		PE3	480	520	3	4	820
	U60 (400-410nm)	PE1	400	440	3	4	680
		PE2	440	480	3	4	750
		PE3	480	520	3	4	820
		PE4	520	560	3	4	880
	U70 (410-420nm)	PE1	400	440	3	4	680
		PE2	440	480	3	4	750
		PE3	480	520	3	4	820
		PE4	520	560	3	4	880

Note: 1. Radiometric power is measured with an accuracy of ±10%

2. The forward voltage is measured with an accuracy of ±0.2V

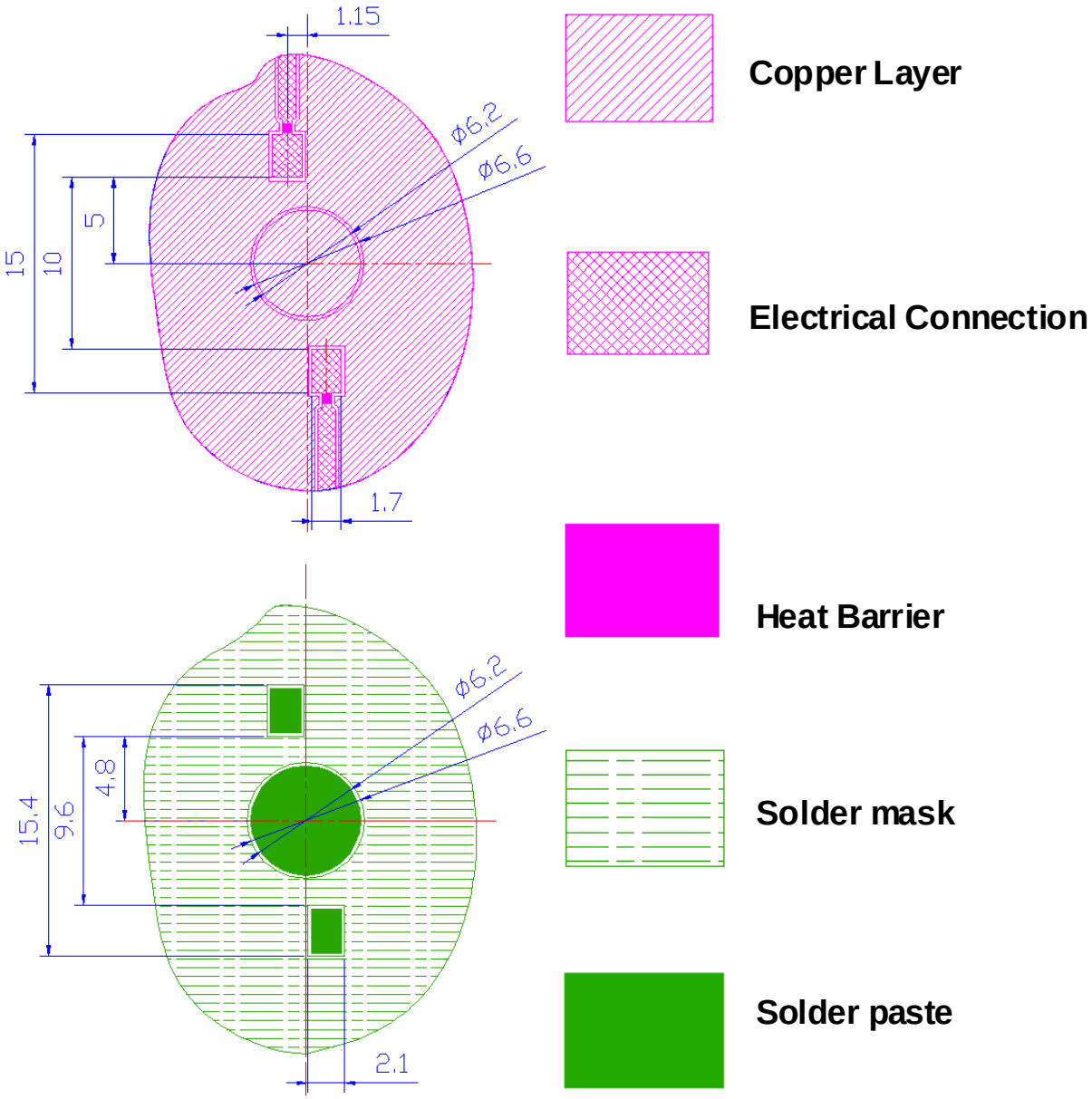
Mechanical Dimensions



Notes:

1. The anode side of the device is denoted by a hole in the lead frame.
2. Electrical insulation between the case and the board is required
3. Drawings are not to scale.
4. All dimensions are all in millimeter.
5. All dimensions without tolerance are for reference only.
6. Specifications are subject to change without notice.

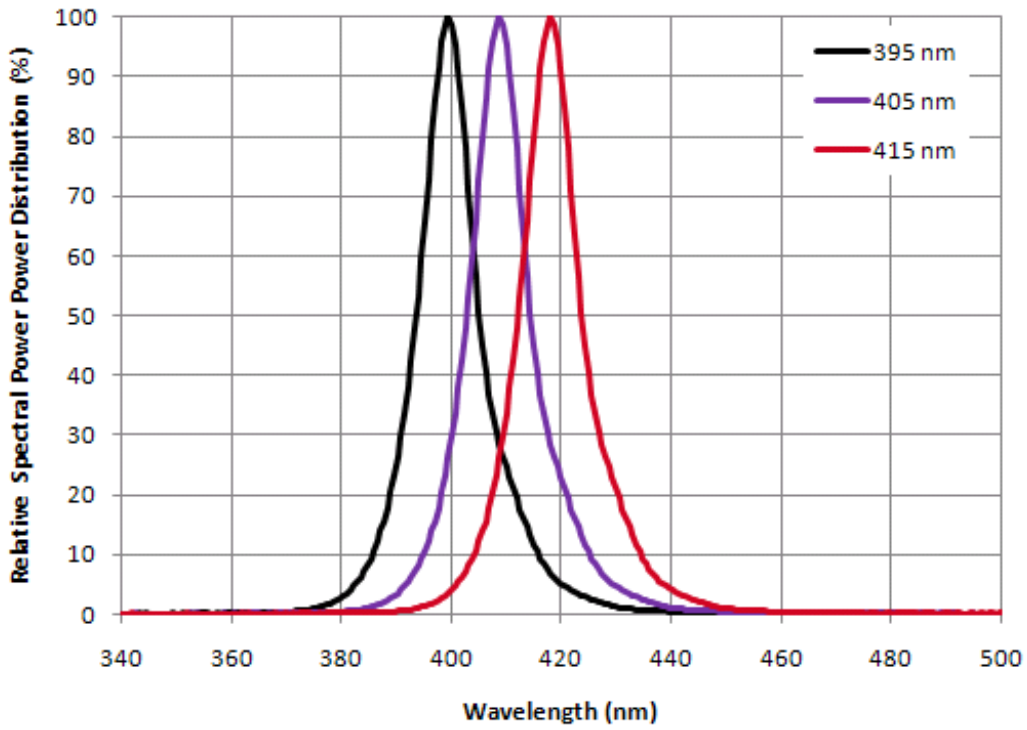
Recommended Solder Pad Design



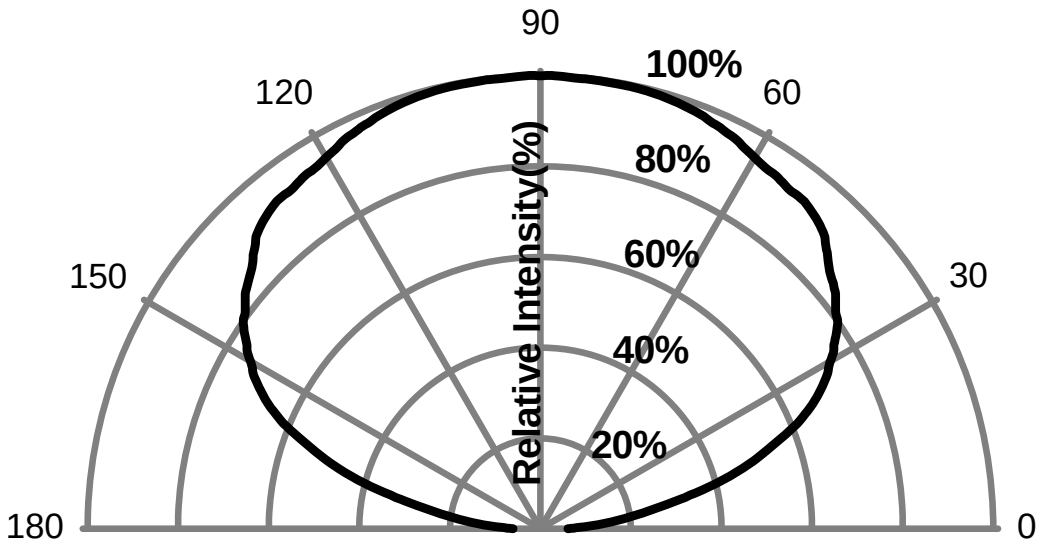
Notes:

1. Drawing is not to scale
2. All dimensions are in millimeter

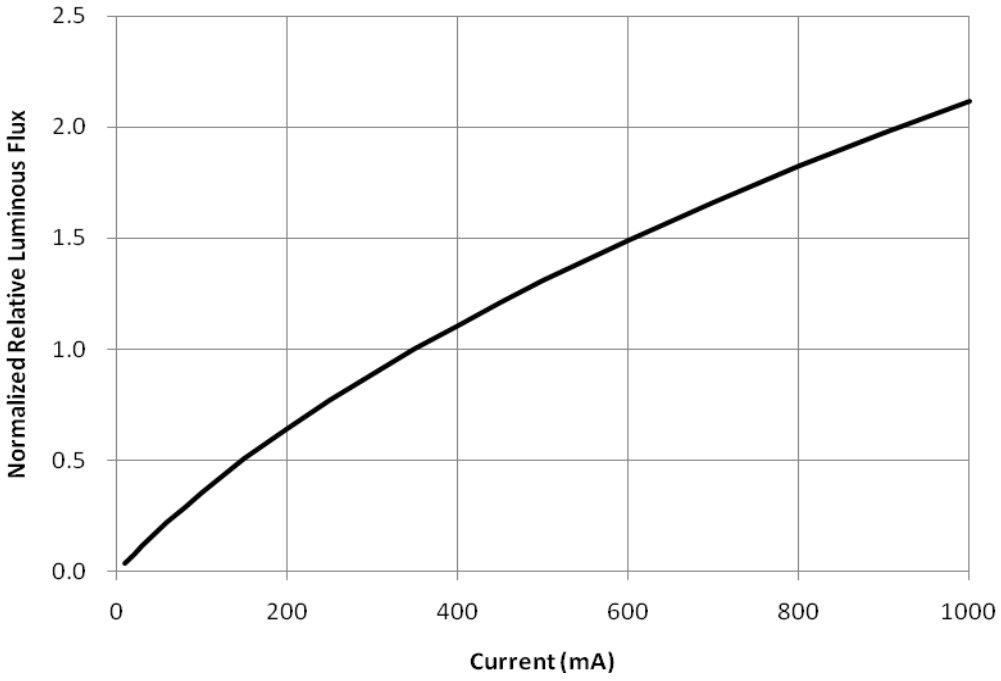
Relative Spectral Power Distribution, T_j=25˚C



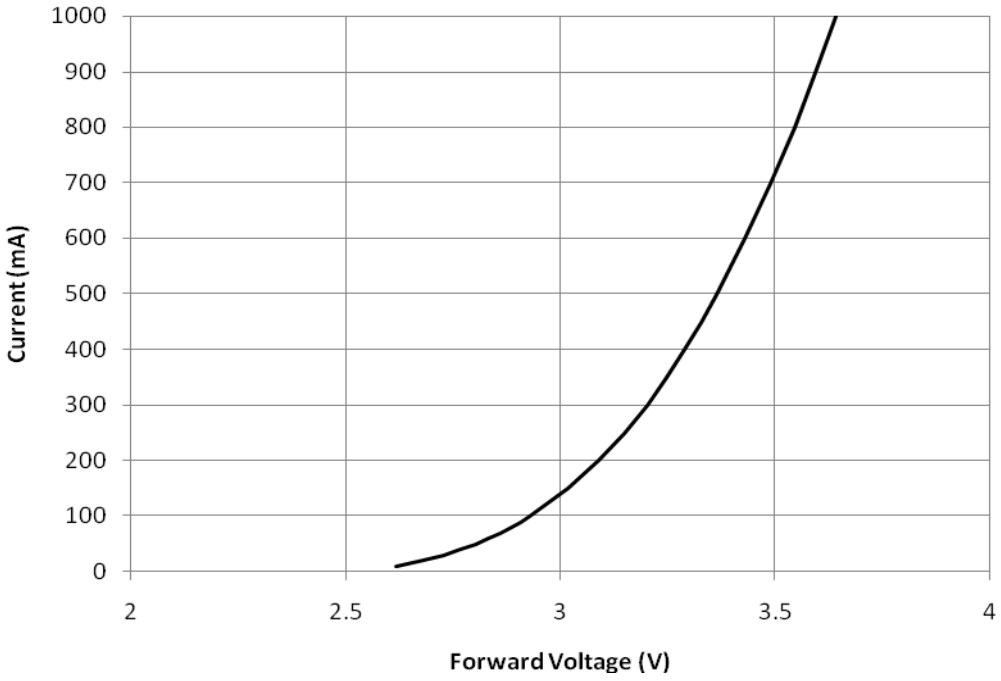
Typical Polar Radiation Pattern



Typical Forward L-I Characteristics, T_j=25˚C

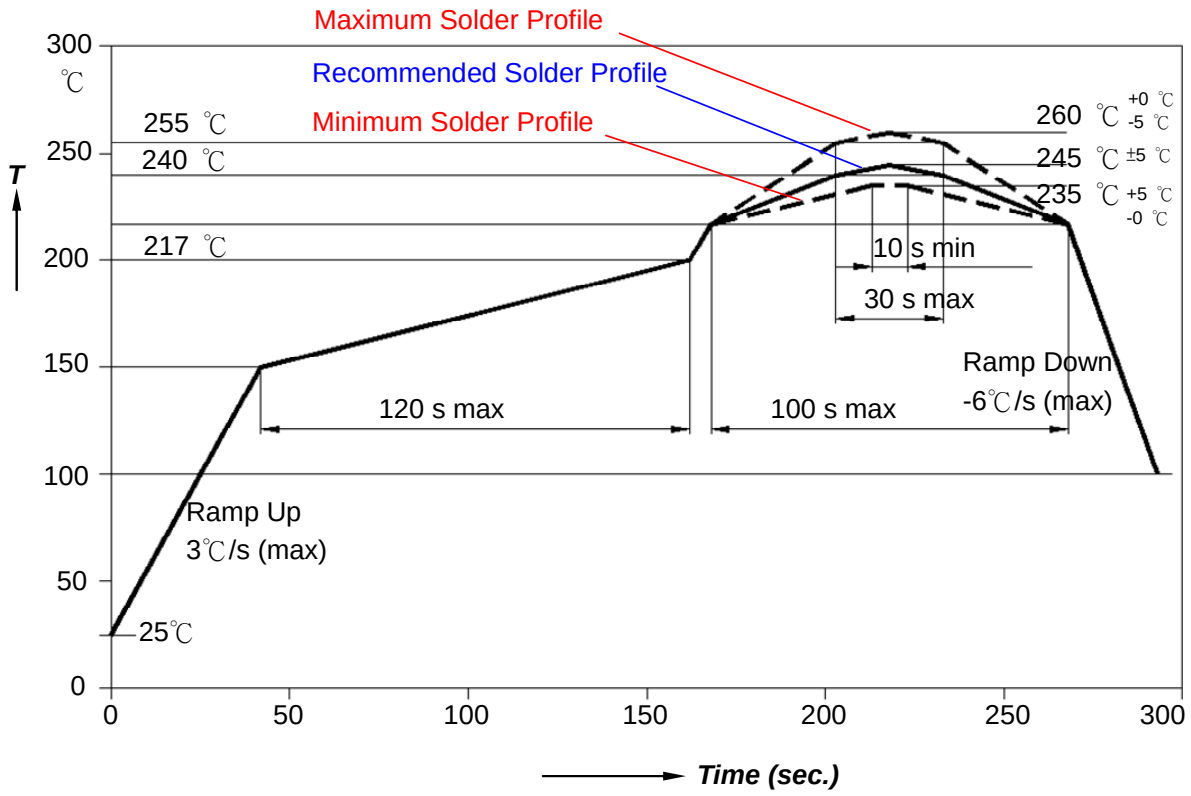


Typical Forward I-V Characteristics, T_j=25˚C



Recommended Soldering Profile

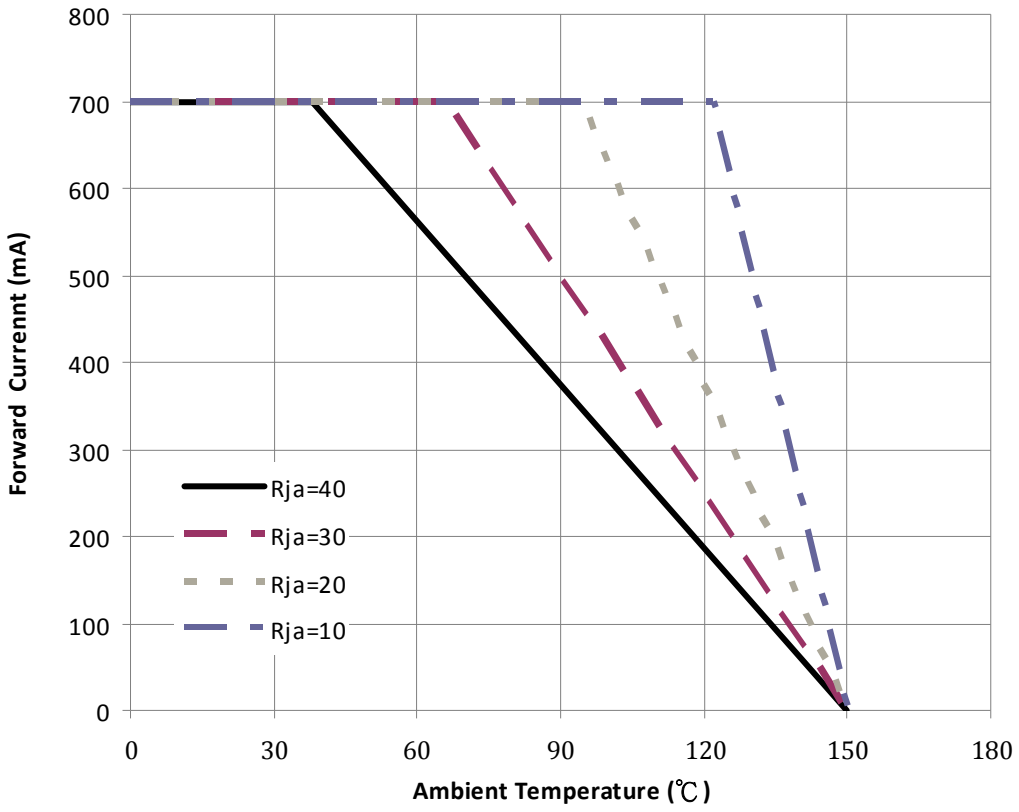
The LEDs can be soldered using the parameters listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest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



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (Ts_{max} 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})	 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/classification Temperature(Tp)	215˚C	240˚C
Time within 5˚C of actual Peak Temperature(tp)	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.

Thermal Design

Thermal design of the end product is important. The thermal resistance between the junction and the solder point ($R\Theta_{J-P}$) and the end product should be designed to minimize the thermal resistance from the solder point to ambient in order to optimize the emitter life and optical characteristics. The maximum operation current is determined by the plot of Allowable Forward Current vs. Ambient 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

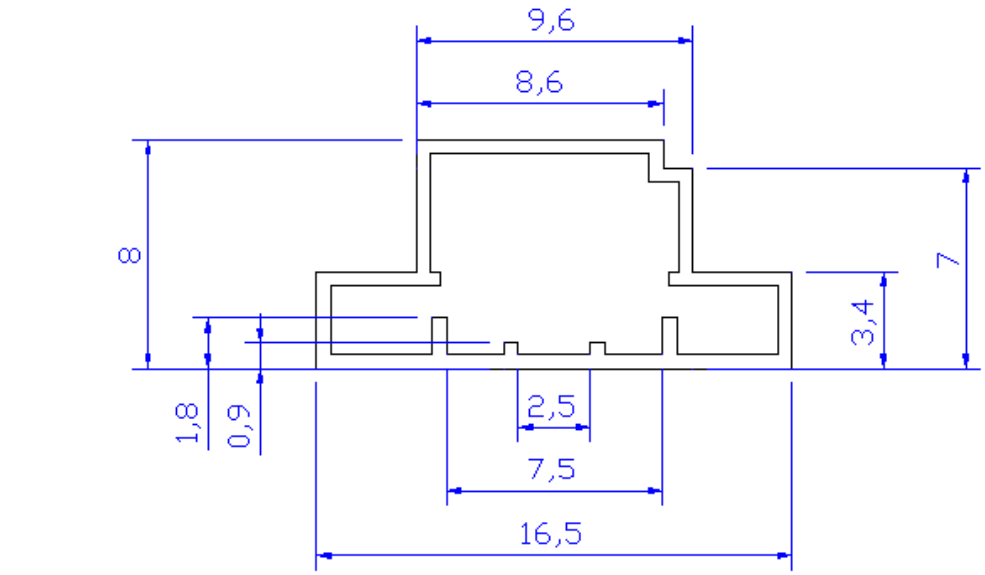
Ta: Ambient temperature

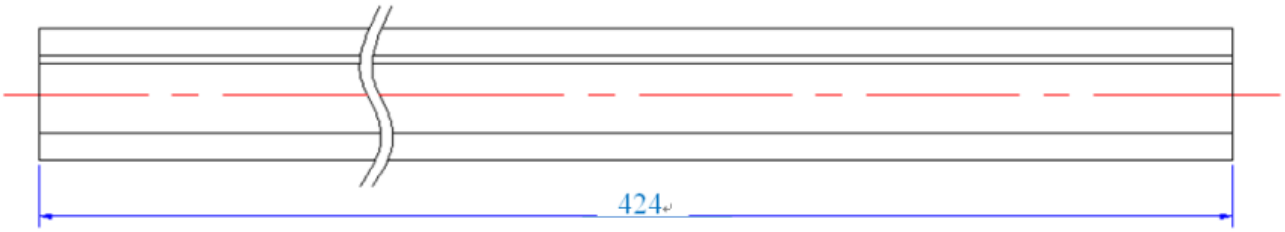
Rja: Thermal resistance between the junction and ambient

W: Input power (I_F*V_F)

Packing information

TUBE DIMENSIONS





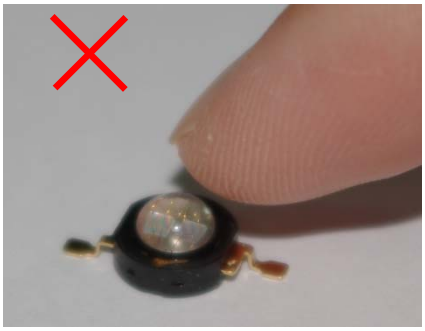
	Dimensions (L*W*H)	Emitter Quantity
Tube	424*16.7*10.0 mm	50 EA

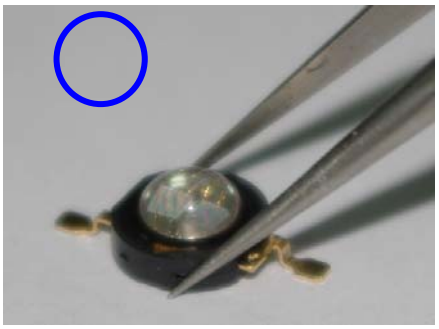
Notes:

1. All dimensions are in millimeter

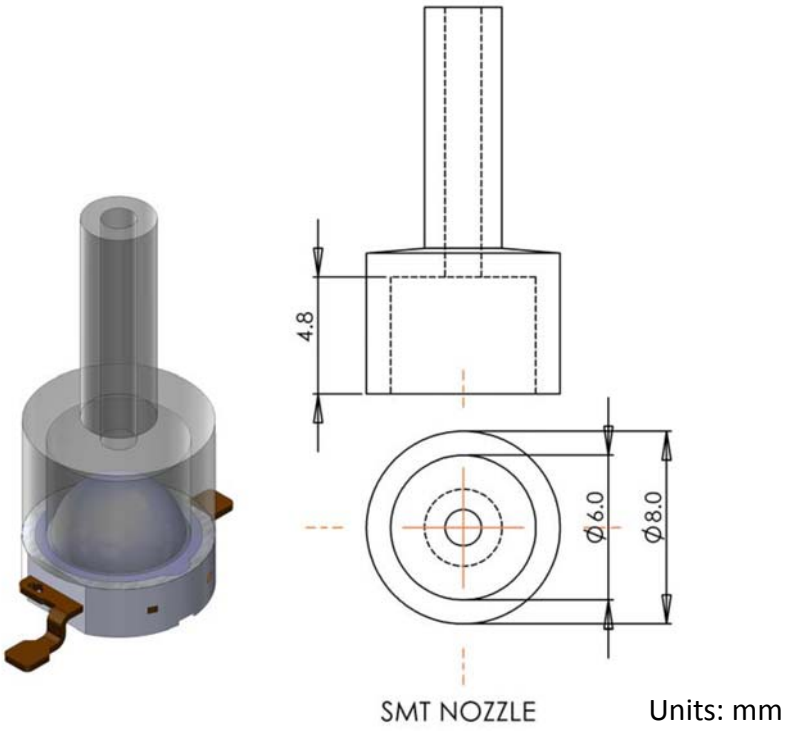
Handling Precautions

- Avoid leaving fingerprints or scratches (by sharp tools) on the silicone resin parts.





- Do not apply force over 2000g or pressure on the silicone molding lens.
- The LEDs should only be picked up by making contact with the sides of the LED body.
- In case of pick-and-place nozzle for surface mount assembly, avoid directly contacting the lens with nozzle. The pickup tool was recommended and shown as below.



SMT NOZZLE Units: mm

Storage

- Before the package is opened, LEDs should be stored at temperatures less than 30°C and humidity less than 50%.
- Before using LEDs, baking treatment should be implemented based on the following conditions: pre-curing at 60±5°C for 24 hours. (To ensure quality, it is recommended to limit the baking treatment to two times.)
- After the package is opened, LEDs should be stored at temperatures less than 30°C and humidity less than 30%. LEDs should be used within 168 hours (7 days) after the package is opened. Baking treatment should be done again when LEDs need to use.

Note:

There will be a humidity Indicator card inside vacuum-sealed moisture barrier bag. If the cards have change color before opening, please inform LED supplier.

About Us

SemiLEDs is an innovative manufacturer of chip-level and packaged LEDs that enable today's advanced solid state lighting solutions. Fully ISO9001 certified, with state of the art fabrication facilities in Hsinchu Science Park, Taiwan, the company employs patented and proprietary technologies that deliver high performance with increased color stability and lumen maintenance. SemiLEDs visible- and ultraviolet-LEDs are found in a wide variety of general lighting applications, including street lights and commercial, industrial and residential architectural lighting, along with specialty industrial applications such as UV curing, medical/cosmetic, counterfeit detection, and horticulture.

SemiLEDs is a publicly traded company on NASDAQ Global Select Market (stock symbol "LEDS"). For investor information, please contact us at **investors@semileds.com.**

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