SEMILEDS

PRODUCT DATASHEET

# P50N-UT-A
# UV LED

## Introduction

The P50N-UT-A LED is a compact, low profile and high performance LED suitable for a wide array of UV applications.

The P50N-UT-A LED is designed to give maximum thermal and optical performance. The P50-UT-A LED is reflow solderable under standard SMT process.

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**RoHS Compliant**

## Features

- Excellent Operating Life
- High Efficacy
- Low Thermal Resistance
- SMD Device
- Instant Light
- Fully Dimmable
- RoHS Compliant

## Characteristics

### Absolute Maximum Ratings

| Parameter | Rating |
|---|---|
| | UV |
| Maximum DC Forward Current (mA) | 180 mA |
| LED Junction Temperature | 125℃ |
| LED Operating Temperature | -40℃~110℃ |
| Storage Temperature | -40℃~110℃ |
| Soldering Temperature | Max. 260℃ / Max. 10sec. (JEDEC 020c) |
| Reverse Voltage | Not designed to be driven in reverse bias |
| Preconditioning | Acc. to JEDEC Level 3 |

### General Characteristics at 150mA (Tj=25℃)

| Part number | Color | Peak Wavelength λp (nm) | | $2\theta_{1/2}$ |
|---|---|---|---|---|
| | | Min | Max | |
| P50N-UT-A | UV | 380 | 420 | Lambertian |

| Part number | Color | Performance at Test Current (150mA) | | | |
|---|---|---|---|---|---|
| | | Group | Minimum Radiometric Power (mW) | VF | |
| | | | | Min | Max |
| P50N-UT-A | UV | B3 | 85 | 2.8 | 3.8 |
| | | C1 | 100 | 2.8 | 3.8 |
| | | C2 | 120 | 2.8 | 3.8 |
| | | C3 | 140 | 2.8 | 3.8 |

Remarks:

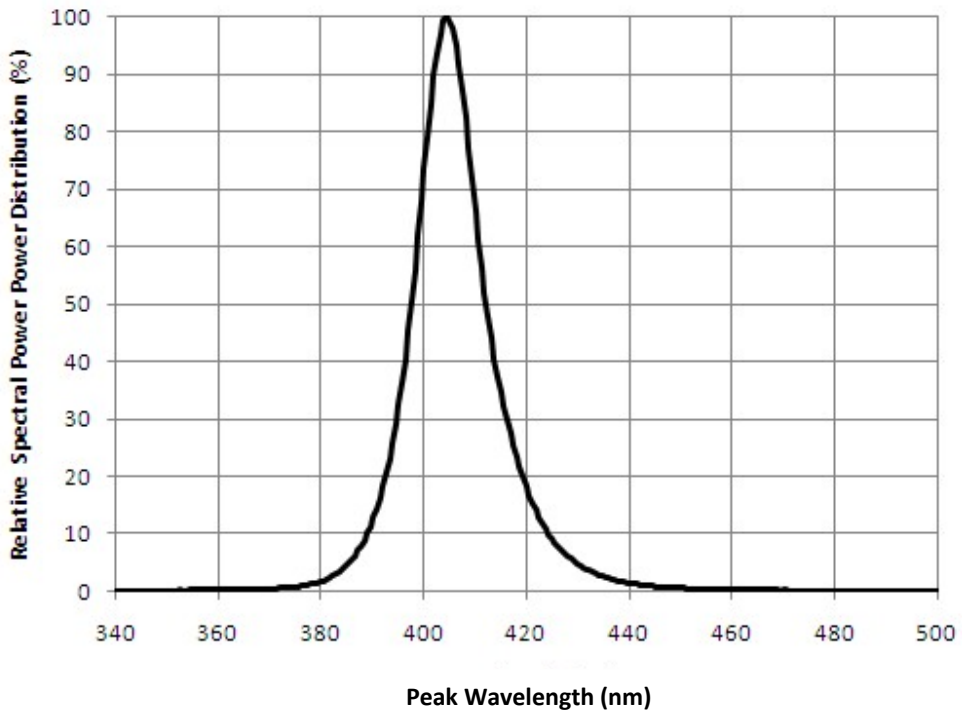
1. Radiometric power is measured with an accuracy of ±10%
2. The forward voltage is measured with an accuracy of ±0.1V

Notes:

1. The peak wavelength is measured with an accuracy of ±1nm
2. Minimum and maximum value refers to the limits and set up of SemiLEDs' 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 SemiLEDs.
4. These devices emit high intensity UV/NUV 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/NUV light. Lens material will need to be tested for UV/NUV light compatibility and durability.

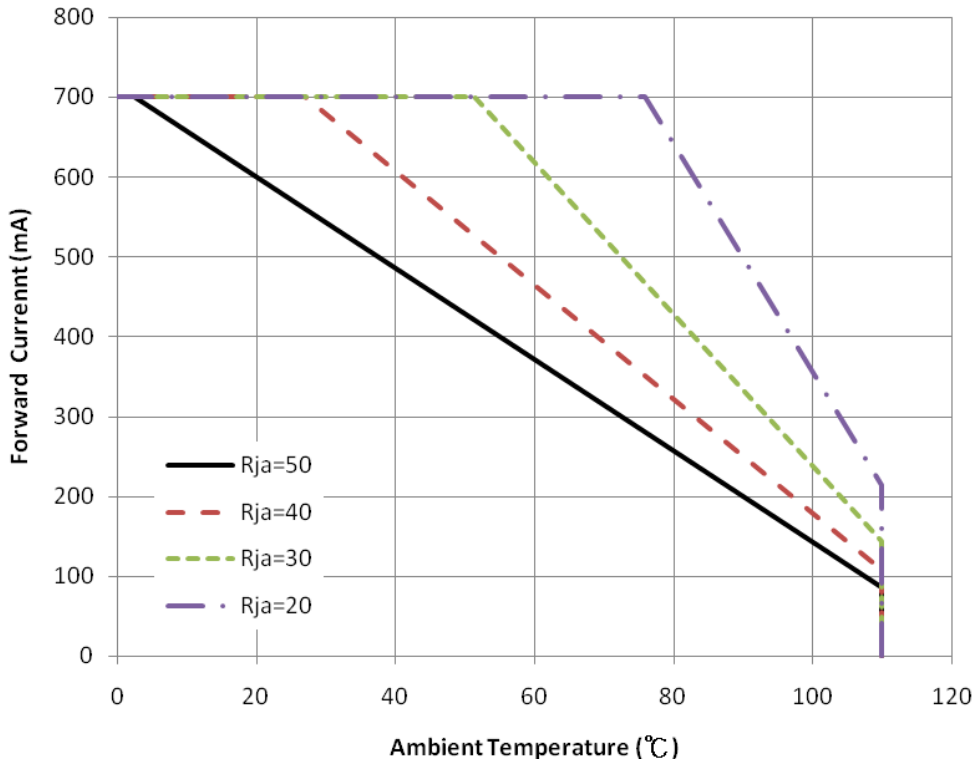
**Caution: Users are requested to comply with the laws and public regulations concerning safety.**

## Relative Spectral Power Distribution, Tc=25 ˚C



## Thermal Design

Thermal design of the end product is important. The thermal resistance between the junction and the solder point ($R\Theta_{J-L}$) is 10°C/W, 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

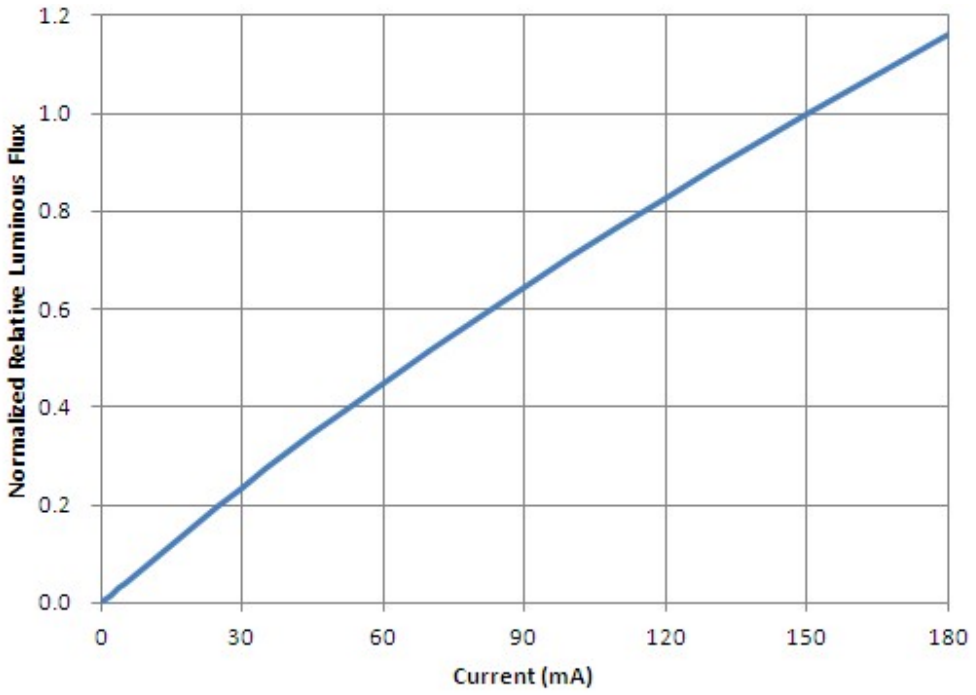
Tj: LED junction temperature

Ta: Ambient temperature

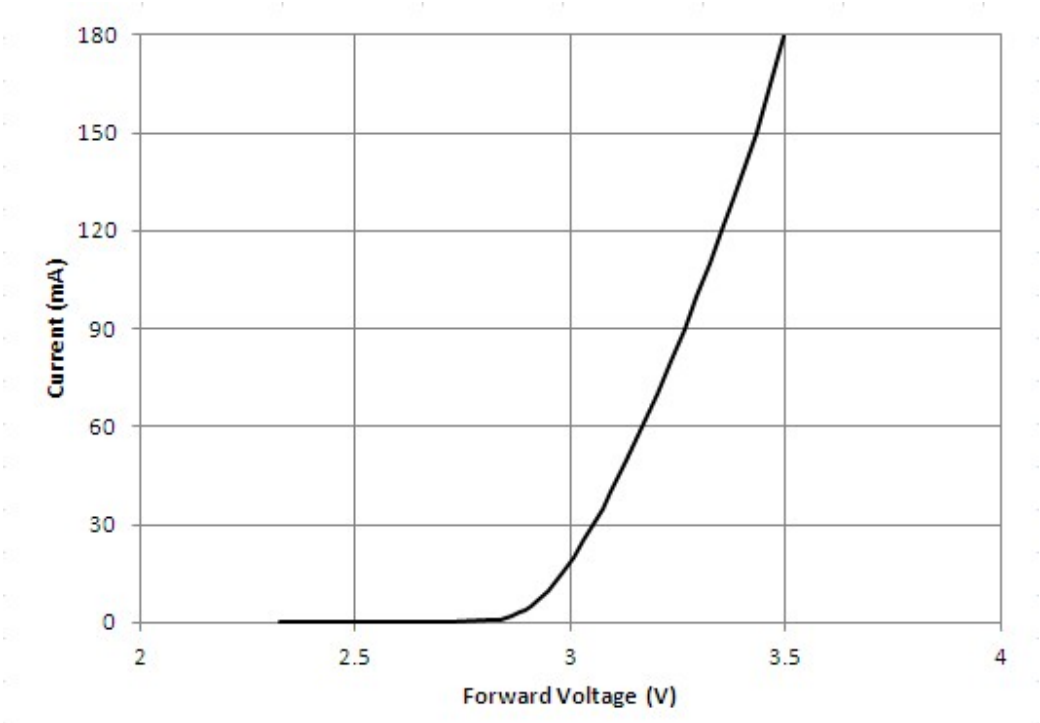
Rja: Thermal resistance between the junction and ambient

W: Input power ( $I_F$*$V_F$)

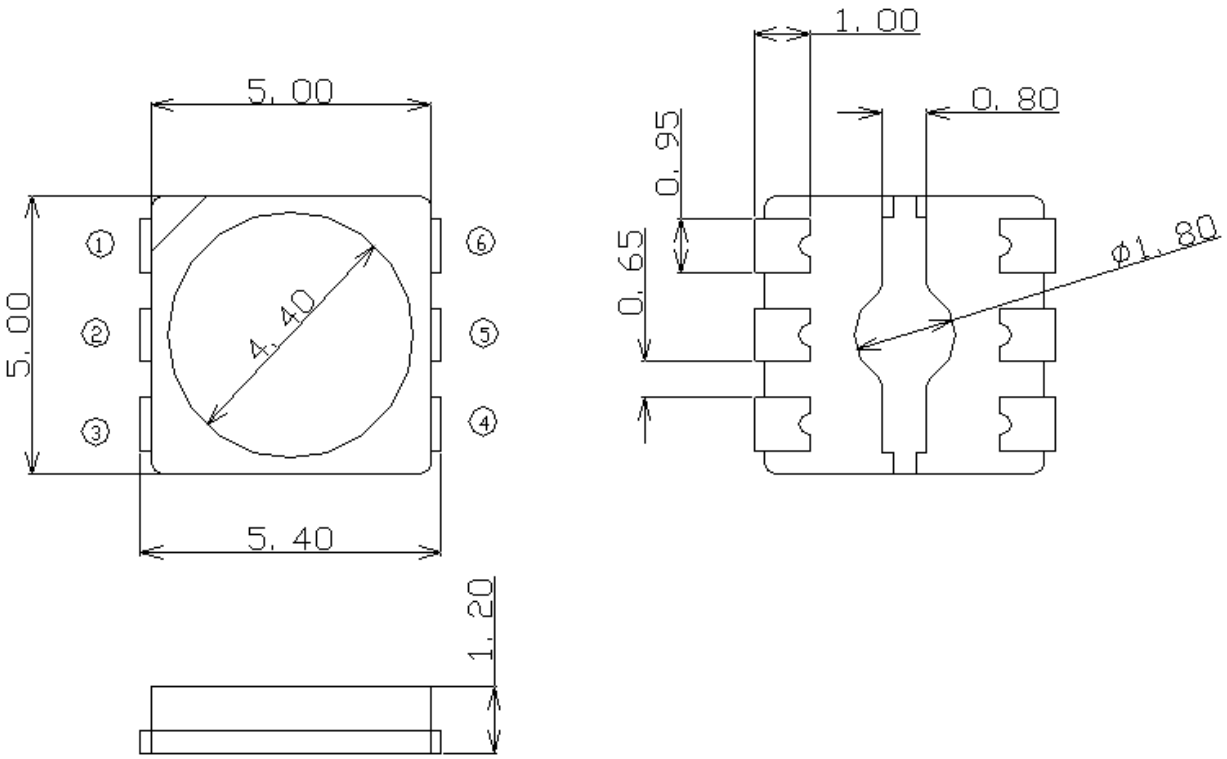
## Typical Forward L-I Characteristics (Tj=25℃)




## Typical Forward I-V Characteristics (Tj=25℃)



## Mechanical Dimensions

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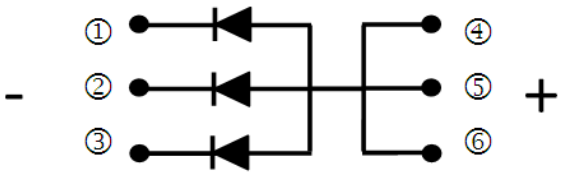


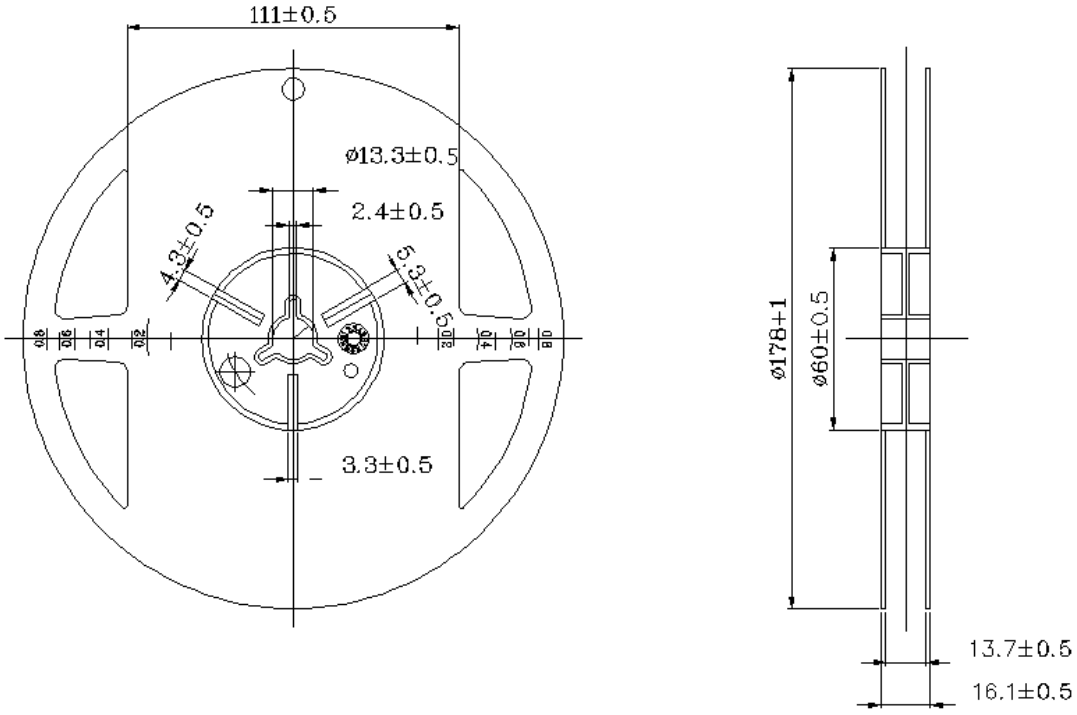

Polarity

Notes :

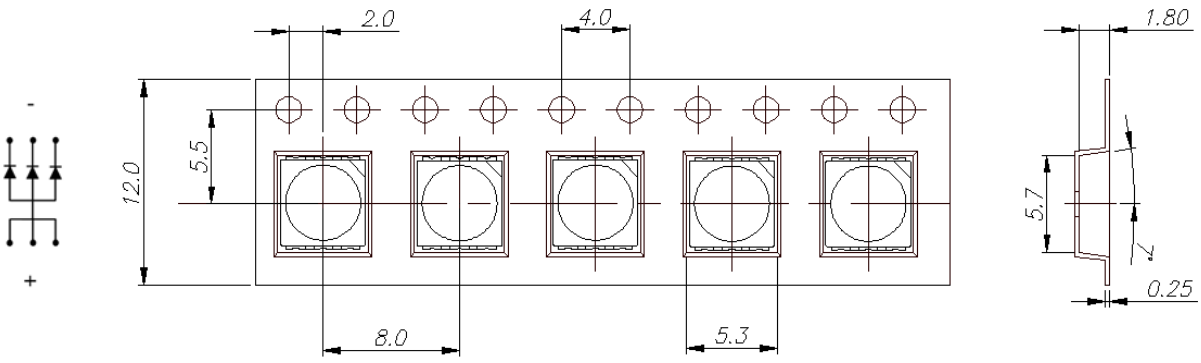
1. Drawings are not to scale.
2. All dimensions are in millimeter.
3. General tolerance is ±0.2mm.
4. The polarity of die heat sink at bottom is Anode; please make sure polarity isolation on MCPCB is done correctly.
5. The Cathode is denoted by the bar (minus sign) on plastic body.

# Shipping Package Information

## Reel Dimension



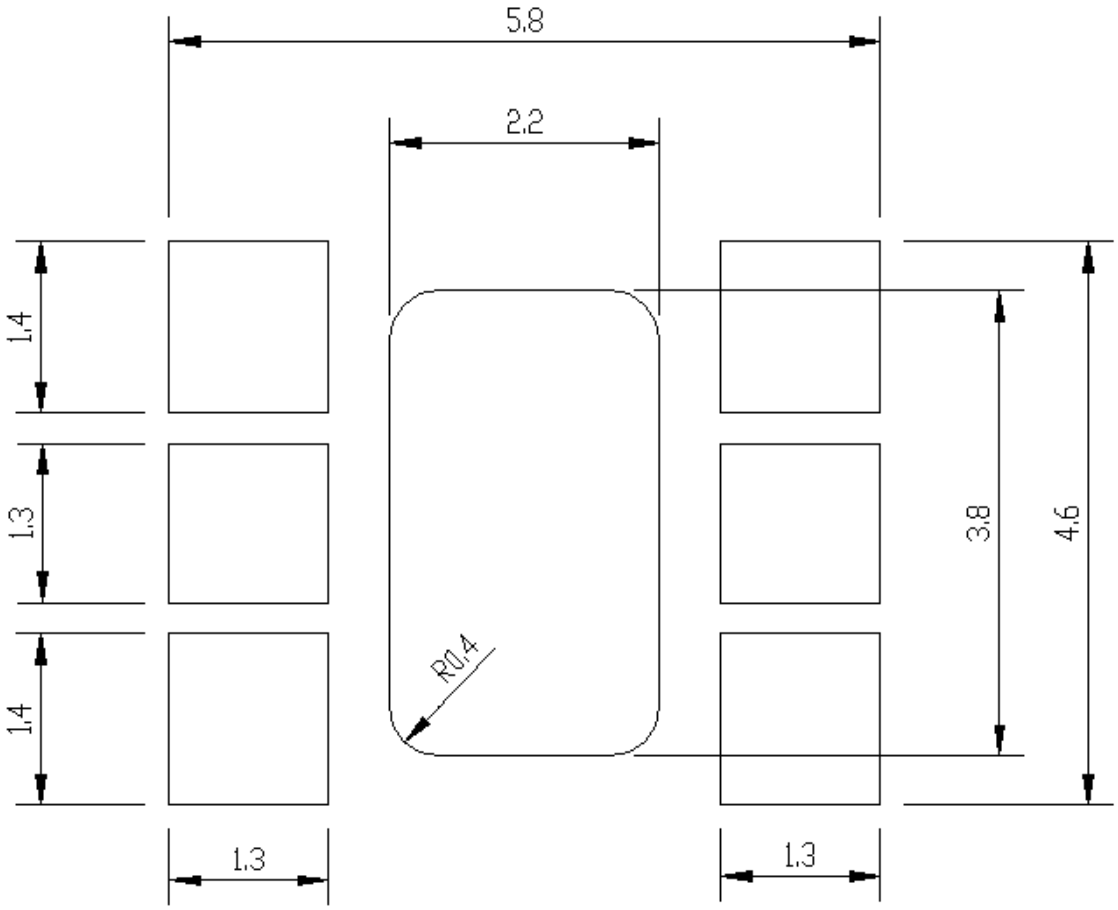

## Carrier Tape




Notes :

1. All dimensions are in millimeter
2. Tolerance for fixed dimensions are 0.1mm
3. Packing unit: 1,000pcs/ reel ( $\varphi$ 178mm)

## Recommended Solder Pad Design

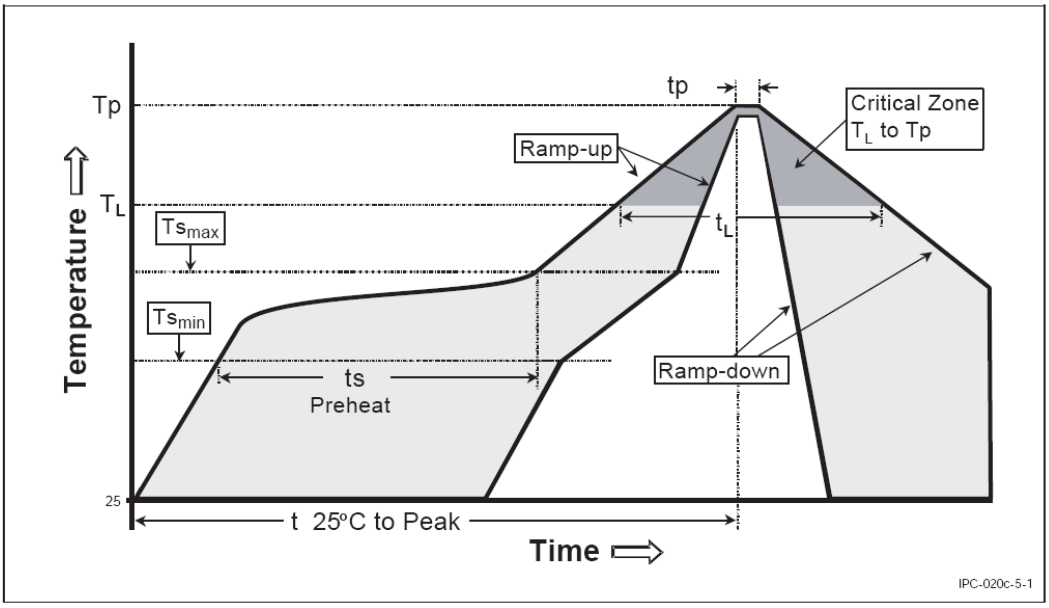



Notes :

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

## Recommended Soldering Profile

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 advised for the LEDs.




| Profile Feature | Sn-Pb Eutecitc Assembly | Pb-Free Assembly |
|---|---|---|
| Average Ramp-up Rate ($Ts_{max}$ to Tp) | 3℃/second max. | 3℃/second max. |
| Preheat<br>- Temperature Min($Ts_{min}$)<br>- Temperature Max($Ts_{max}$)<br>- Time(tsmin to $ts_{max}$) | <br>100℃<br>150℃<br>60-120 seconds | <br>150℃<br>200℃<br>60-180 seconds |
| Time maintained above:<br>- Temperature($T_L$)<br>- Time($t_L$) | <br>183℃<br>60-150 seconds | <br>217℃<br>60-150 seconds |
| Peak/classification Temperature(Tp) | 215℃ | 260℃ |
| Time within 5℃ of actual Peak Temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp-Down Rate | 6℃/second max. | 6℃/second max. |
| Time 25℃ to Peak Temperature | 6 minutes max. | 8 minutes max. |

## About Us

**SemiLEDs Corporation** is a US based manufacturer of ultra-high brightness LED chips with state of the art fabrication facilities in Hsinchu Science Park, Taiwan. SemiLEDs specializes in the development and manufacturing of vertical LED chips in blue (white), green, and UV using a patented copper alloy base. This unique design allows for higher performance and longer lumen maintenance. In December 2008, The World Economic Forum recognized SemiLEDs innovations with the 2009 Technology Pioneer Award. SemiLEDs is fully ISO 9001:2008 Certified

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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