SEMILEDS

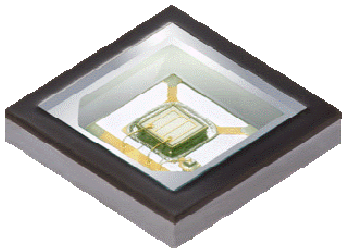
PRODUCT DATASHEET

# S50N-U

## HIGH POWER 365NM UV LED

### Introduction

SemiLEDs S50N-U LEDs are part of our range of UV LED products that have revolutionized the UV market through being markedly more efficient and less polluting than traditional mercury lamps. As a result, S50N-U LEDs excel in a growing range of applications such as curing, currency/document verification, tanning, medical, and sterilization. Features of the LED include form factor, wavelength and lifetime, add flexibility to UV applications.



All SemiLEDs UV S50 use the patented vertical chips.. MvpLED™ chips copper-alloy substrate provides maximum heat transfer from the junction to the board or heat sink. These thermal benefits coupled with the optical advantages derived from our vertical structure make the S50N-U LED suitable for e designs that require higher drive currents in order to maximize light density. The package is reflow-able under standard SMT process.

### Table of Contents



**RoHS Compliant**

## Features

- Long Operating Life
- High Efficacy
- Low Thermal Resistance
- Low Profile Design
- SMT Device
- Instant Light
- Fully Dimmable
- RoHS Compliant

## Applications

- UV air purifier
- Medical applications
- UV activated applications
- Counterfeit detection
- Special chemical detection
- High resolution optics
- Curing

## Characteristics

**Absolute Maximum Ratings, Ta at 25°C**

| Parameter | Rating |
|---|---|
| DC Forward Current (mA) | 700 mA |
| Pulse Forward Current [1] | 1000 mA |
| Power Dissipation | 3 W |
| Allowable Reverse Current[2] | 85 mA |
| Operating Temperature[3] | -20~80℃ |
| Storage Temperature | -40~100℃ |
| Junction Temperature | 125℃ |
| Soldering Temperature | 260℃ 10sec. |
| ESD Classification (HBM) | Class 2 |

Reminding:

[1] $I_{FP}$ Condition: Pulse width ≦ 10msec. and duty ≦ 1/10.

[2] This device isn't designed to be driven in reverse bias.

[3] Please confirm the junction temperature is under maximum rating.

**Typical Optical Characteristics at 700mA**

| Characteristics | Symbol | Typical | Unit |
|---|---|---|---|
| Radiation Power | Po | 160 | mW |
| Peak Wavelength | λp | 368 | nm |
| Full Width at Half Maximum | △λ | 10 | nm |
| Viewing Angle | $2\theta_{1/2}$ | 110 | Degree |

*All characteristics are measured under 15ms pulse mode condition.

**Typical Electrical / Thermal Characteristics, Ta=25 oC, If=700mA**

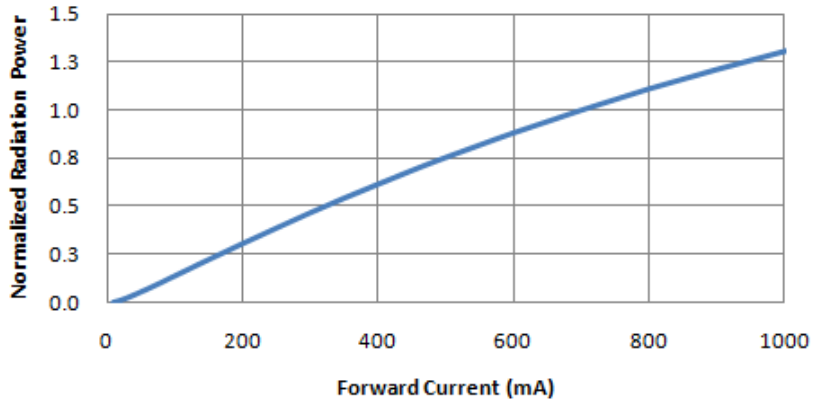
| Characteristics | Symbol | Typical | Max | Unit |
|---|---|---|---|---|
| Typical Forward Voltage (@350mA) | $V_F$ | 3.85 | - | V |
| Typical Forward Voltage (@700 mA)) | $V_F$ | 4.25 | 5.00 | V |
| Temperature Coefficient of Forward Voltage | △VF/△Tj | -3~-5 | - | mV/°C |
| Thermal Resistance (Rj-b) | RΘj-b | 5 | - | °C/W |

*The Rj-b is the thermal resistance from junction to backside pad of component.
*All characteristics are measured under 15ms pulse mode condition.

# Typical Electrical / Thermal Characteristics

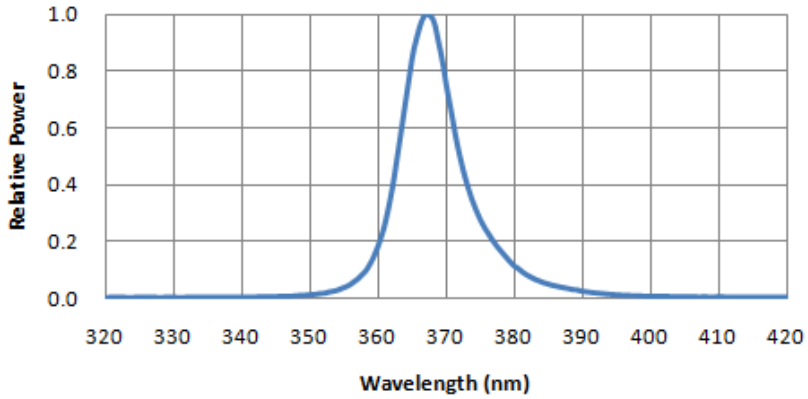
### Typical Relative Power vs. Forward Current

*All characteristics are measured under 15ms pulse mode condition.



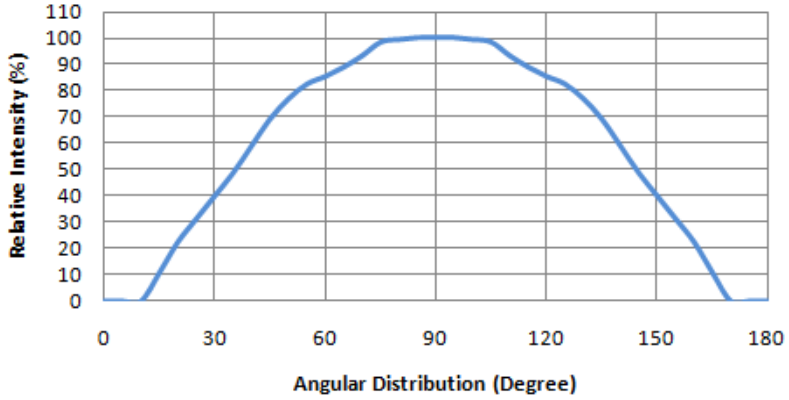

### Typical Wavelength Spectrum Distribution

*All characteristics are measured under 15ms pulse mode condition.



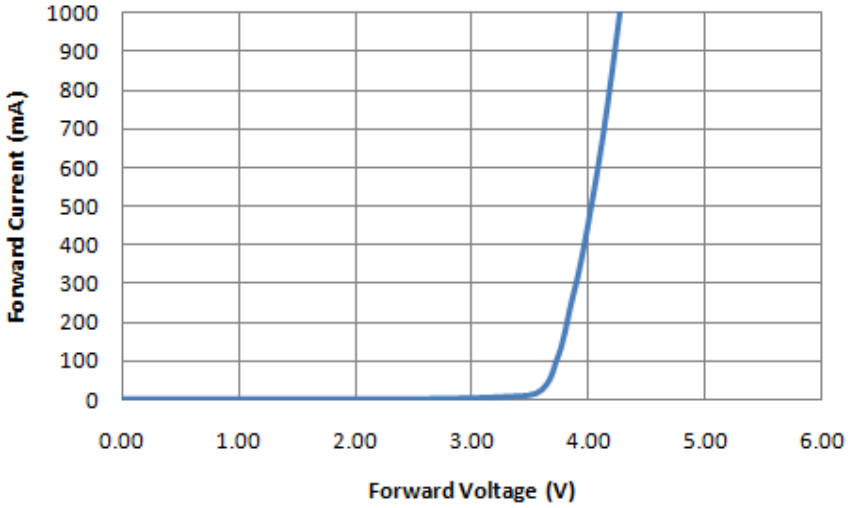

### Typical Spatial Radiation Pattern

*All characteristics are measured under 15ms pulse mode condition.



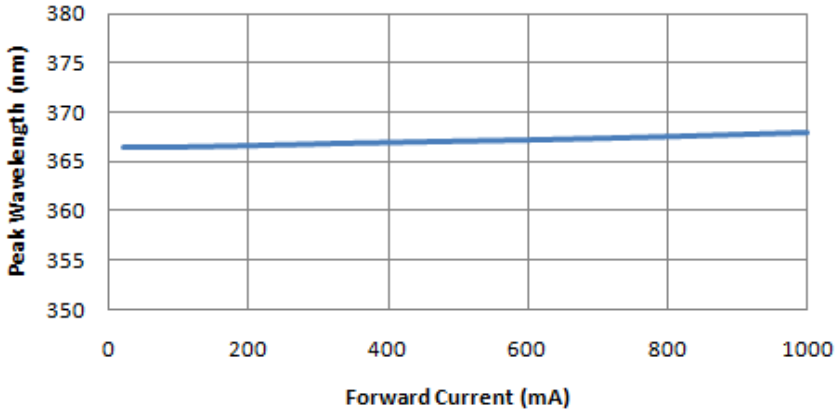
**Typical Forward Current vs. Forward Voltage**

*All characteristics are measured under 15ms pulse mode condition.

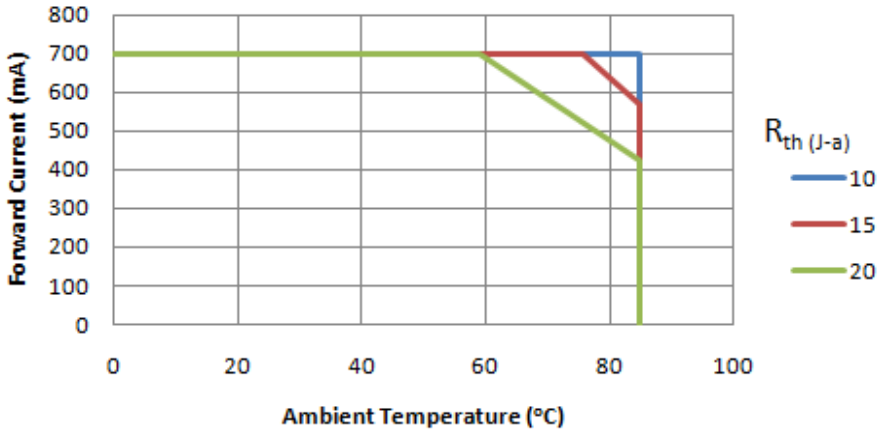



**Typical Peak Wavelength vs. Forward Current**

*All characteristics are measured under 15ms pulse mode condition.

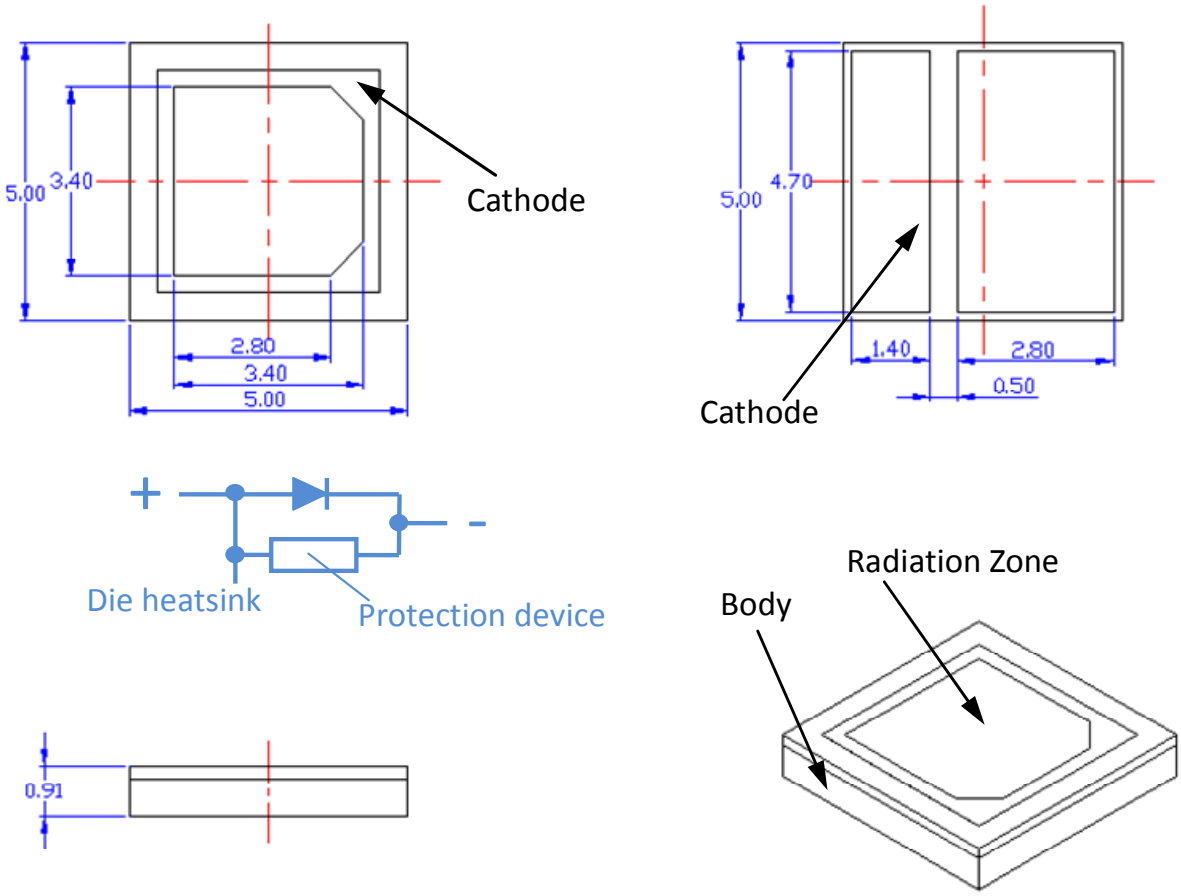


## Current Derating Curves




Note: $R_{th(J-a)}$ is the thermal resistance from LED junction to ambient

## Mechanical Dimensions




**Notes:**

- Drawings are not to scale
- All dimensions are in millimeter
- General tolerance is ±0.2mm.

**Materials**

Chip：MvpLED UV LED

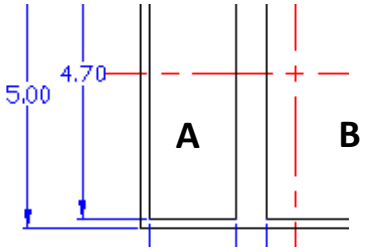
Submount：Silicon

Glass protection：UV resistant Hard Glass

Electrodes：Au Plating

# Recommended Soldering Information

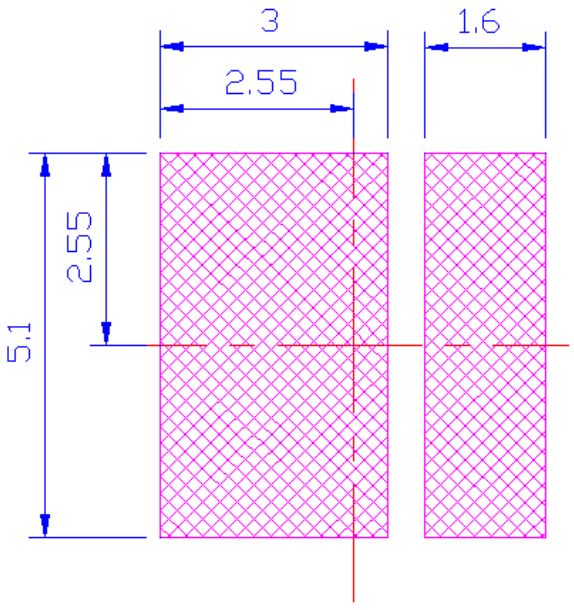
### Emitter Pad Design




Unit: mm

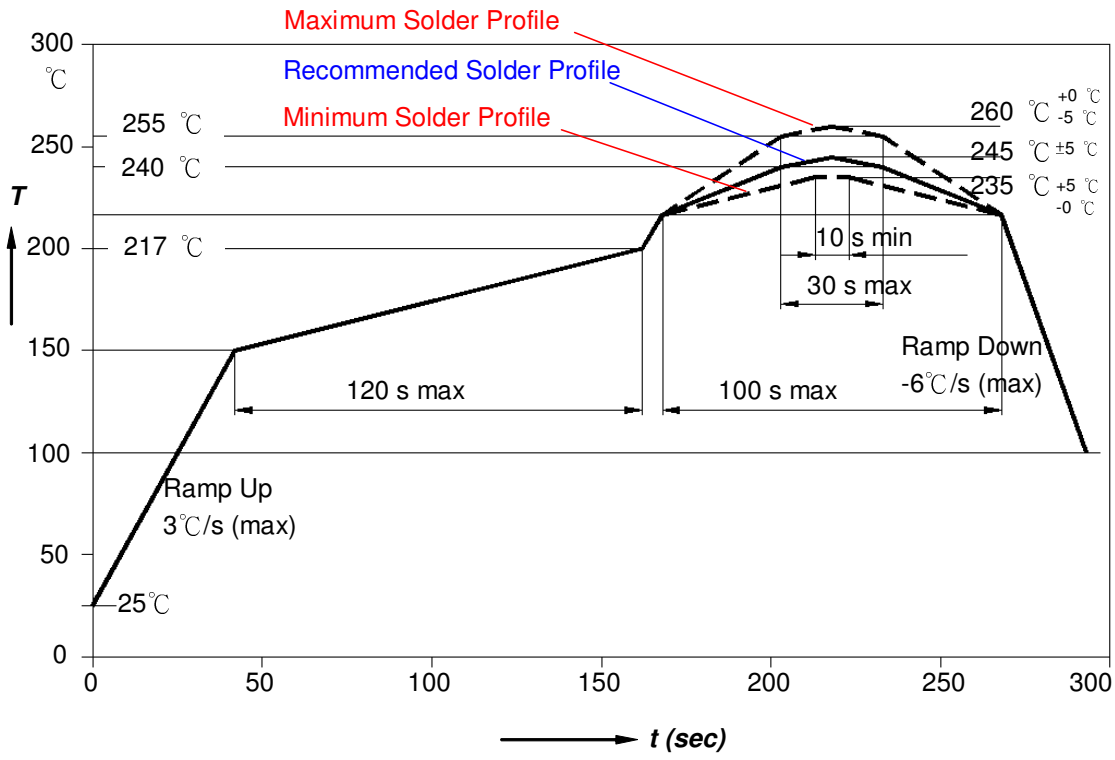
| Pad | Function |
|---|---|
| A | Cathode |
| B | Anode and Thermal |

### Solder Pad Design




Unit：mm

### Reflow Profile for Lead free Soldering




## Cautions

The S50 LED is a UV device and emits a UV beam during operation. Don't look at the UV light directly or look through the optical system. The S50 LED radiates intense UV light; precautions must be taken with UV light, including wearing protective glasses to avoid the human eye directly catching the UV light. Users are requested to comply public regulations and safety laws.

## Notice:

This product is ***not for use, sale, or importation into the United States***. Any agreement, documentation, or communication (in any form, through any medium and for any purpose) related to this product is provided subject to the above disclaimer, and no (and seller hereby disclaims any) indemnification is provided for this product against any infringement claim of intellectual property rights in the United States. The limitations above do not apply to products that are purchased and delivered before October 1, 2012.

## 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**.

For further company or product information, please visit us at **www.semileds.com** or please contact **sales@ semileds.com**.

SEMILEDS

www.semileds.com

**ASIA PACIFIC**
3F, No. 11, KeJung Rd.
Chu-Nan Site
Hsinchu Science Park
Chu-Nan 350, Miao-Li County
Taiwan, ROC

Tel: +886-37-586788
Fax: +886-37-582688
sales@semileds.com