



# ROITHNER LASERTECHNIK GmbH

WIEDNER HAUPTSTRASSE 76  
TEL. +43 1 586 52 43 -O. FAX. -44

1040 VIENNA AUSTRIA  
OFFICE@ROITHNER-LASER.COM



## SMB1N-435V-02

- Blue High Power LED
- 435 nm, 800 mW
- Integrated ESD Protection
- InGaN chip, 1000 x 1000  $\mu\text{m}$
- Beam Angle:  $\pm 10^\circ$



### Description

**SMB1N-435V-02** is a surface mount InGaN based high power blue LED, with a typical peak wavelength of 435 nm, optical output power of 800 mW @ 500 mA, and **integrated ESD protection**. It comes in polyamide resin SMD package (PA9T) with silver plated soldering pads (lead free solderable), copper heat sink, and silicone resin molded lens. Additional variants with different beam angles are available on request.

### Maximum Ratings\*

| Parameter                                  | Symbol     | Values                                    |       | Unit             |
|--------------------------------------------|------------|-------------------------------------------|-------|------------------|
|                                            |            | Min.                                      | Max.  |                  |
| Power Dissipation                          | $P_D$      |                                           | 2300  | mW               |
| Forward Current                            | $I_F$      |                                           | 500   | mA               |
| Pulse Forward Current **                   | $I_{FP}$   |                                           | 700   | A                |
| Reverse Voltage                            | $U_R$      | <b>not designed for reverse operation</b> |       |                  |
| Reverse Current ( $U_R = 5V$ )             | $I_R$      |                                           |       |                  |
| Thermal Resistance                         | $R_{THJA}$ |                                           | 10    | K/W              |
| Junction Temperature                       | $T_J$      |                                           | 120   | $^\circ\text{C}$ |
| Operating Temperature                      | $T_{CASE}$ | - 40                                      | + 100 | $^\circ\text{C}$ |
| Storage Temperature                        | $T_{STG}$  | - 40                                      | + 100 | $^\circ\text{C}$ |
| Lead Solder Temperature ( $t_{max} = 5s$ ) | $T_{SLD}$  |                                           | + 250 | $^\circ\text{C}$ |

\* Operating close to or exceeding these parameters may damage the device

\*\* duty cycle = 1 %, pulse width = 10  $\mu\text{s}$

### Electro-Optical Characteristics ( $T_{CASE} = 25^\circ\text{C}$ )

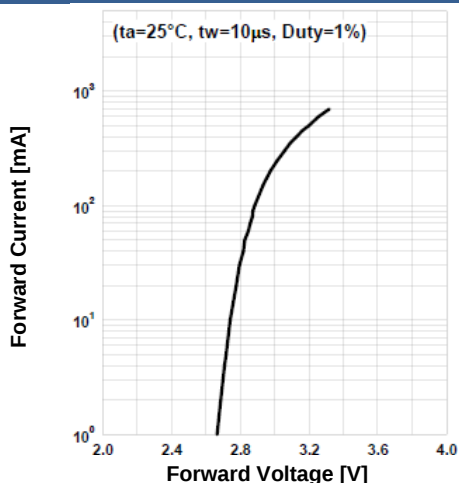
| Parameter            | Symbol           | Conditions                  | Values |      |      | Unit  |
|----------------------|------------------|-----------------------------|--------|------|------|-------|
|                      |                  |                             | Min.   | Typ. | Max. |       |
| Peak Wavelength      | $\lambda_P$      | $I_F = 500 \text{ mA}$      | 425    |      | 445  | nm    |
| Half Width           | $\lambda_\Delta$ | $I_F = 500 \text{ mA}$      |        | 17   |      | nm    |
| Forward Voltage      | $U_F$            | $I_F = 500 \text{ mA}$      |        | 3.2  | 4.5  | V     |
|                      | $U_{FP}$         | $I_{FP} = 700 \text{ mA}^*$ |        | 3.3  |      |       |
| Total Radiated Power | $P_O$            | $I_F = 500 \text{ mA}$      |        | 800  |      | mW    |
|                      |                  | $I_{FP} = 700 \text{ mA}^*$ |        | 1000 |      |       |
| Radiant Intensity    | $I_E$            | $I_F = 500 \text{ mA}$      |        | 2000 |      | mW/sr |
|                      |                  | $I_{FP} = 700 \text{ mA}^*$ |        | 2600 |      |       |
| Beam Angle           | $2\theta_{1/2}$  | $I_F = 100 \text{ mA}$      |        | 20   |      | deg.  |
| Rise Time            | $t_r$            | $I_F = 500 \text{ mA}$      |        | 25   |      | ns    |
| Fall Time            | $t_f$            | $I_F = 500 \text{ mA}$      |        | 60   |      | ns    |

\* duty cycle = 1 %, pulse width = 10  $\mu\text{s}$

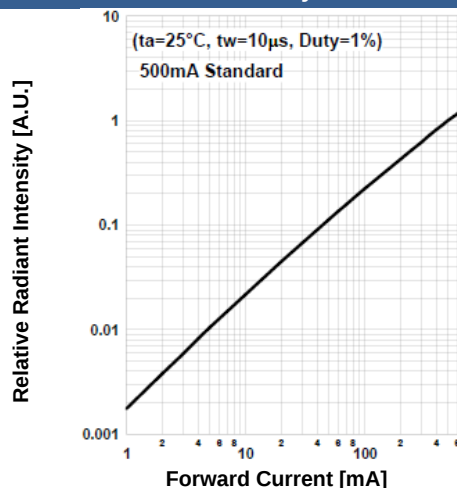


## Typical Performance Curves

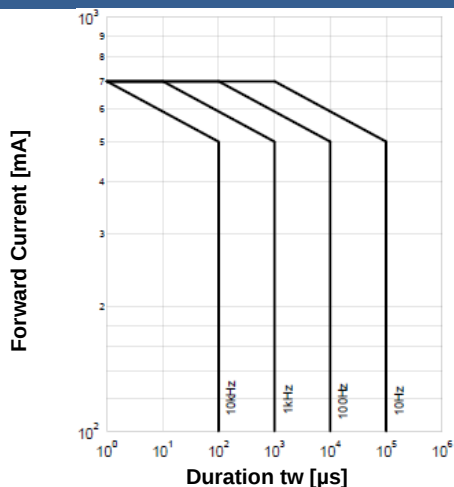
Forward Current vs. Forward Voltage



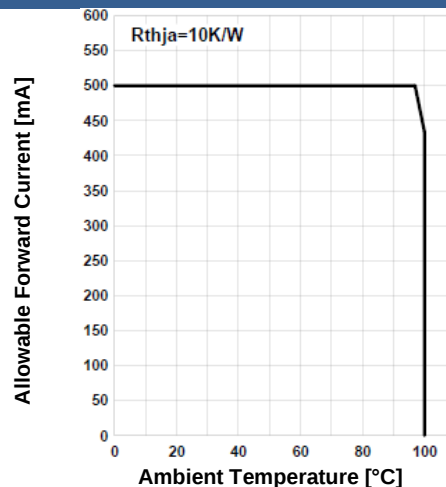
Relative Radiant Intensity vs. Forward Current



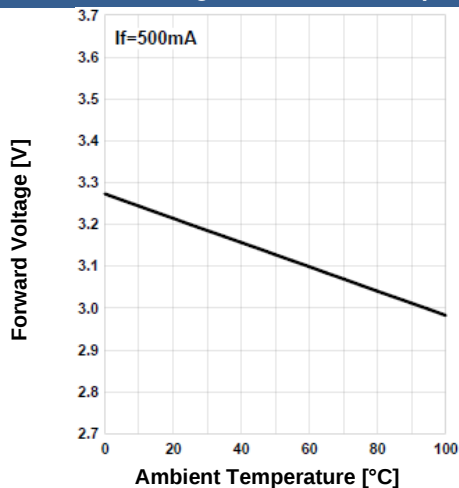
Forward Current vs. Pulse Duration



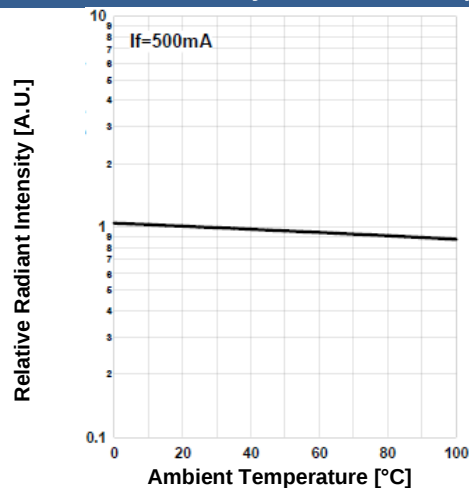
Allowed Forward Current vs. Amb. Temperature



Forward Voltage vs. Ambient Temperature



Rel. Radiant Intensity vs. Ambient Temperature





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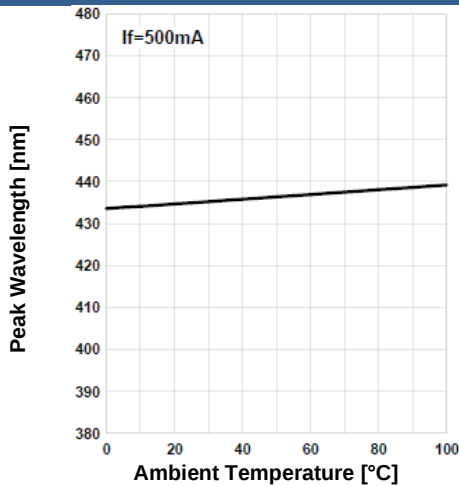
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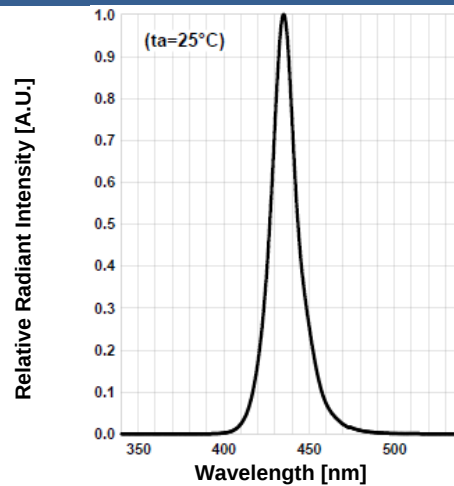


## Typical Performance Curves

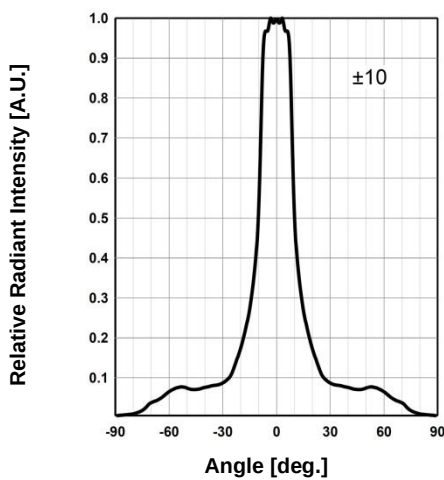
Peak Wavelength vs. Amb. Temp.



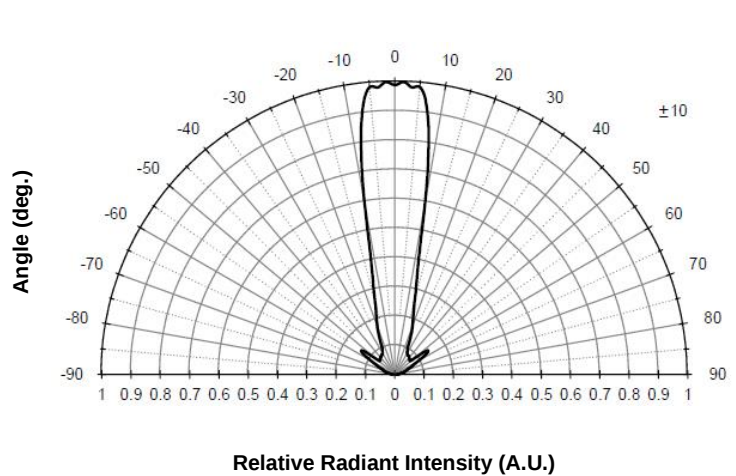
Relative Spectral Emission



Radiation Characteristics

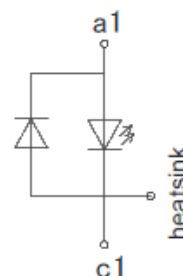
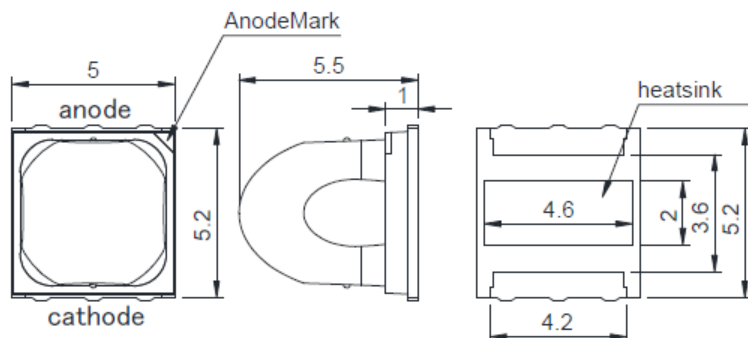


Radiation Characteristics



## Outline Dimensions

PA9T



| Lead   | Function |
|--------|----------|
| Pin a1 | Anode    |
| Pin c1 | Cathode  |

all dimensions in mm

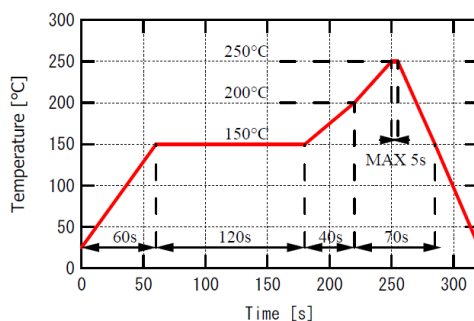


## General Notes

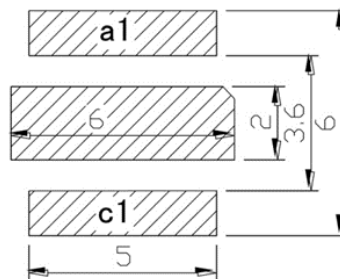
### Soldering

- Do avoid overheating of the LED
- Do avoid electrostatic discharge (ESD)
- Do avoid mechanical stress, shock, and vibration
- Do only use non-corrosive flux
- Do not apply current to the LED until it has cooled down to room temperature after soldering

Recommended soldering conditions



Recommended soldering patterns



Unit: mm

### Cleaning

- **Cleaning with isopropyl alcohol, propanol, or ethyl alcohol is recommended**
- DO NOT USE acetone, chloroform, trichloroethylene, or MKS
- DO NOT USE ultrasonic cleaners

### Static Electricity

- **LEDs are sensitive to electrostatic discharge (ESD).**
- Precautions against ESD must be taken when handling or operating these LEDs
- Surge voltage or electrostatic discharge can result in complete failure of the LED.

### Radiation

- During operation these LEDs do emit light, which **could be hazardous to skin and eyes, and may cause cancer.**
- Do avoid exposure to the emitted light. Protective glasses if needed
- It is further advised to attach a warning label on products/systems.

### Operation

- **Do only operate LEDs with a current source.**
- Running these LEDs from a voltage source will result in complete failure of the device.
- Current of a LED is an exponential function of the voltage across it. Usage of current regulated drive circuits is mandatory.

### Storage

- The **maximum shelf life** of LEDs in the originally sealed aluminum bag is **12 months**.
- Before opening the aluminum bag, please store it at **<30 °C, <60 % RH**.
- After opening the aluminum bag, please solder the LEDs within **72 hours (floor life)** at **5 – 30 °C, <50 % RH**.
- Put any unused, remaining LEDs and silica gel back in the same aluminum bag and then vacuum-seal the bag.
- It is recommended to keep the re-sealed bag in a desiccator at **<30%RH**.