



## SMB1N-970D-02

- Infrared High Power LED
- 970 nm, 780 mW
- AlGaAs chip, 1000 x 1000  $\mu\text{m}$
- PA9T SMD package
- Beam Angle:  $\pm 10^\circ$



### Description

**SMB1N-970D-02** is a surface mount AlGaAs based high power infrared LED, with a typical peak wavelength of 970 nm and optical output power of 780 mW @ 1 A. 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	$P_D$		2500	mW
Forward Current	$I_F$		1000	mA
Pulse Forward Current **	$I_{FP}$		3000	mA
Reverse Voltage	$U_R$		5	V
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 ( $T_{CASE} = 25^\circ\text{C}$ )

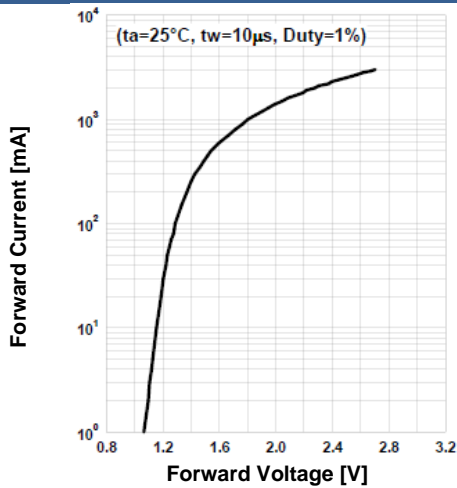
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Peak Wavelength	$\lambda_P$	$I_F=1\text{ A}$	960		980	nm
Half Width	$\lambda_\Delta$	$I_F=1\text{ A}$		60		nm
Forward Voltage	$U_F$	$I_F=1\text{ A}$		1.8	2.5	V
	$U_{FP}$	$I_{FP}=3\text{ A}^*$		2.7		
Total Radiated Power	$P_O$	$I_F=1\text{ A}$		780		mW
		$I_{FP}=3\text{ A}^*$		2000		
Radiant Intensity	$I_E$	$I_F=1\text{ A}$		3700		mW/sr
		$I_{FP}=3\text{ A}^*$		9900		
Beam Angle	$2\theta_{1/2}$	$I_F=100\text{ mA}$		20		deg.
Rise Time	$t_r$	$I_F=1\text{ A}$		35		ns
Fall Time	$t_f$	$I_F=1\text{ A}$		30		ns

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

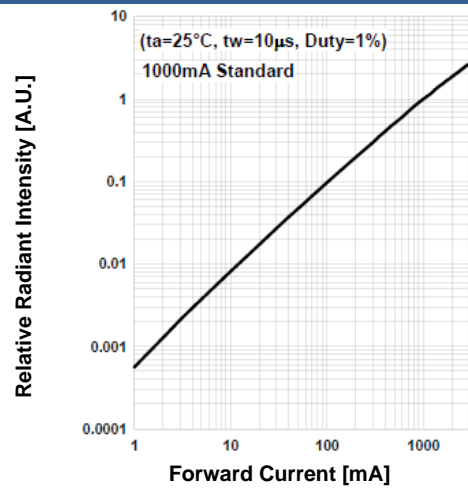


## Typical Performance Curves

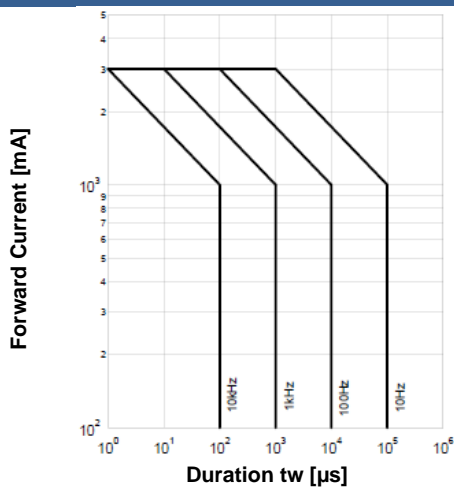
### Forward Current vs. Forward Voltage



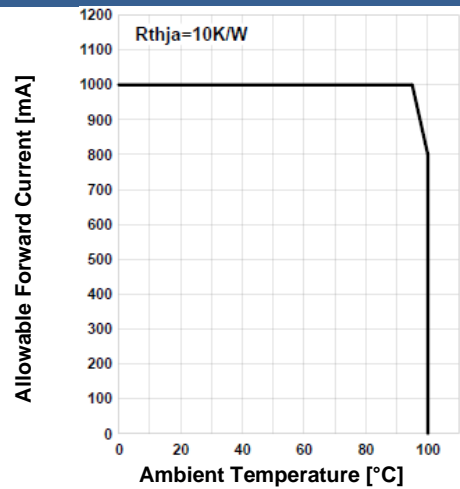
### Relative Radiant Intensity vs. Forward Current



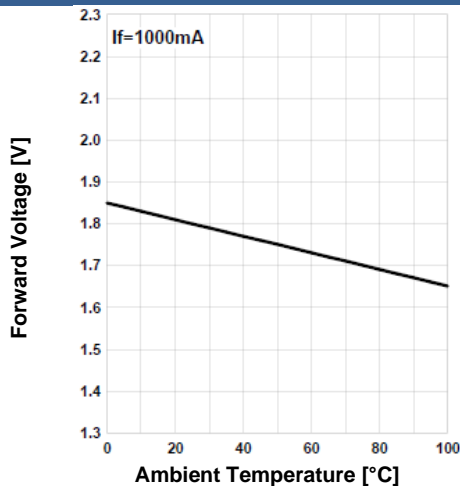
### Forward Current vs. Pulse Duration



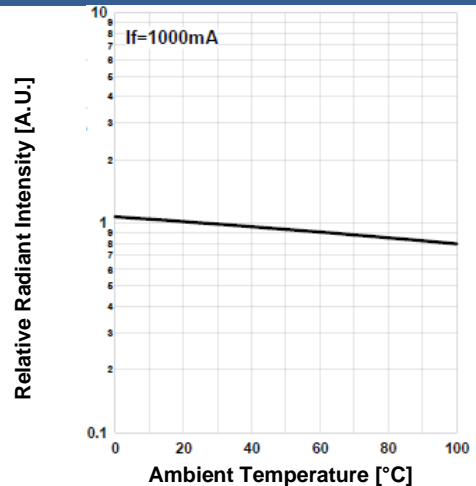
### Allowed Forward Current vs. Amb. Temperature



### Forward Voltage vs. Ambient Temperature

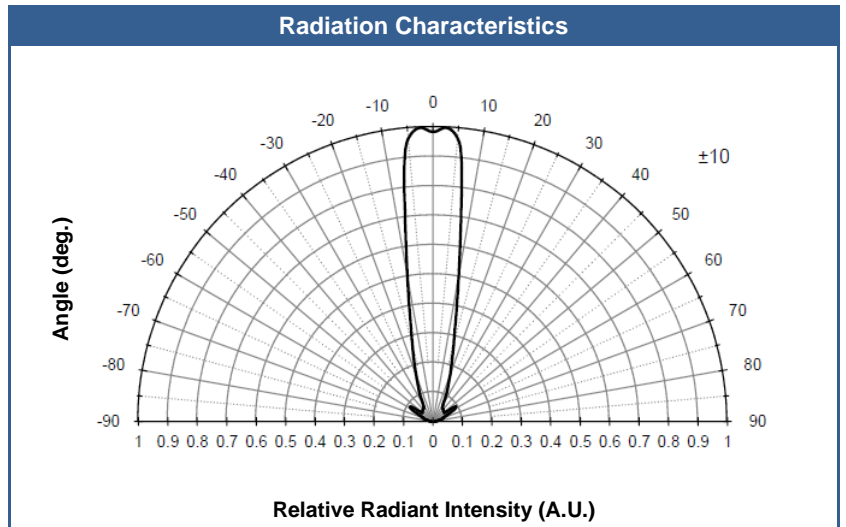
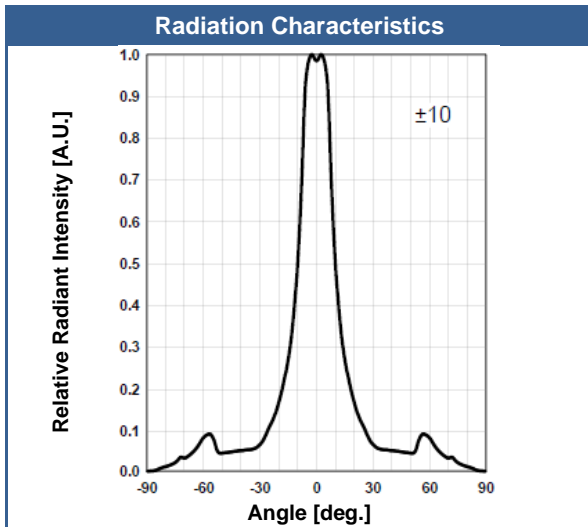
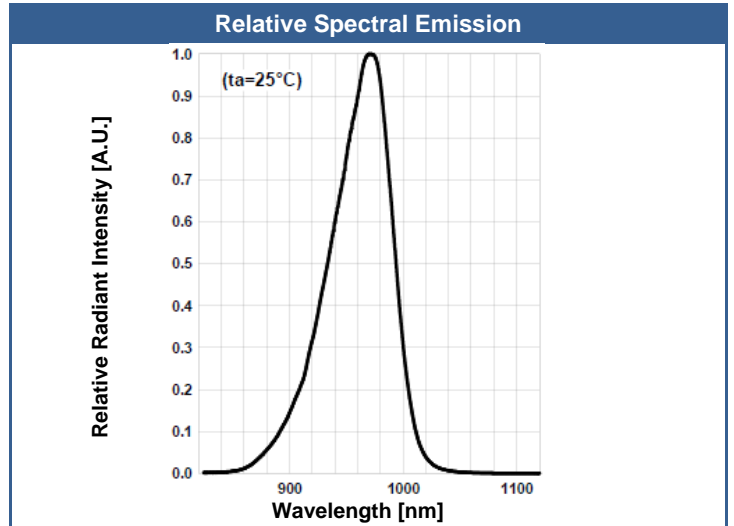
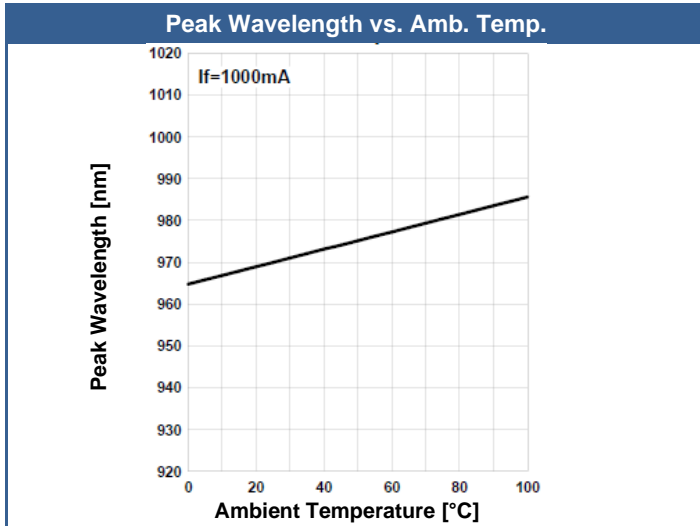


### Rel. Radiant Intensity vs. Ambient Temperature





## Typical Performance Curves



## Outline Dimensions

**PA9T**

Lead	Function
Pin a1	Anode
Pin c1	Cathode

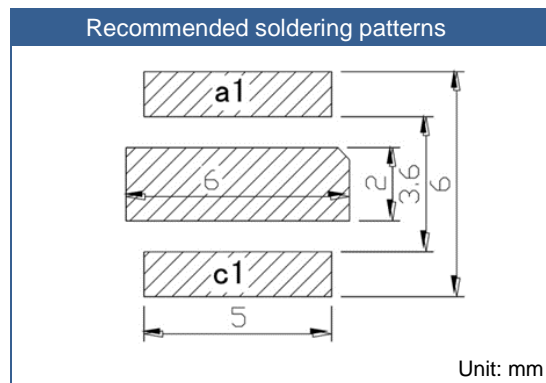
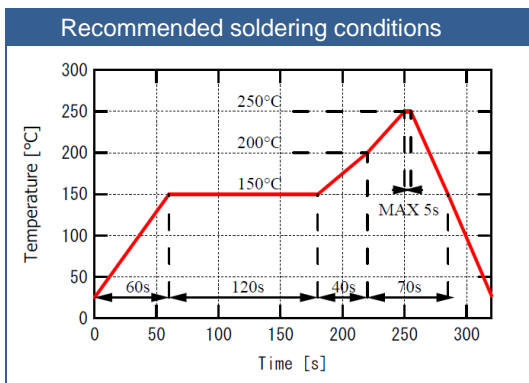
all dimensions in mm



## 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



### 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.