

## **100mW SMD Laser Diode (680nm, Red)**

**P/N: 2-EE-P01-04029-A**

### **◆ Features:**

- Super high flux output and high luminance
- Designed for high current operation
- Low thermal resistance
- UV resistance
- Superior ESD Protection
- Lead free product
- RoHS compliant

### **◆ Applications:**

- Automotive interior / exterior lighting
- Automotive signal lighting
- Automotive forward lighting
- Torch
- Architectural lighting
- LCD TV / Monitor backlight module
- Projector light source
- Traffic signals
- Task lighting
- Decorative / Pathway lighting
- Remote / Solar powered lighting
- Household appliances

### Maximum Ratings (Ta=25°C)

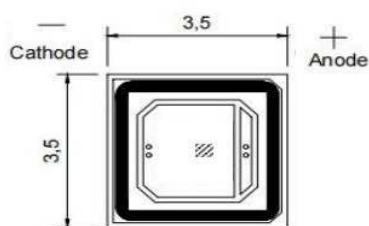
Item	Symbol	Value	Unit
DC Forward Current	IF	180	mA
Pulsed Forward Current	IFP	300*	mA
Reverse Voltage	VR	5	V
Operating Temperature	Topr	-30 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +100	°C
Dice Temperature	Tj	120	°C

### Electrical-Optical Characteristics (Ta=25°C)

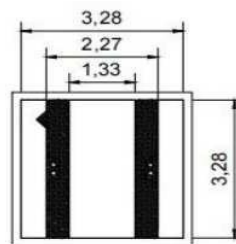
Parameter	Symbol	Value			Unit	Test condition
		Min.	Typ.	Max.		
Operating Voltage	V <sub>op</sub>	---	2.4	2.6	V	I <sub>f</sub> =180mA
Reverse Current	I <sub>r</sub>	---	---	10	μA	V <sub>r</sub> =5V
Threshold Current	I <sub>th</sub>	10	30	40		
Viewing angle	2θ <sub>1/2</sub>	---	25	---	Deg	I <sub>f</sub> =180mA
Half Wave	HW	---	2.1	---	nm	I <sub>f</sub> =180mA
Conversion Efficiency	PCE	23	29	---	%	I <sub>f</sub> =180mA
Differential resistance	R <sub>s</sub>	2	5	10	Ω	I <sub>f</sub> =180mA
Peak Wavelength	λ <sub>p</sub>	670	680	690	nm	I <sub>f</sub> =180mA
Output Optical Power	P <sub>o</sub>	80	120	---	mW	I <sub>f</sub> =180mA

## Outline Dimensions

### ■ Degree Angle Dimensions



Top View



Bottom View



Side View

### Electrical Internal Circuit



### Recommend Solder Pad (mm)

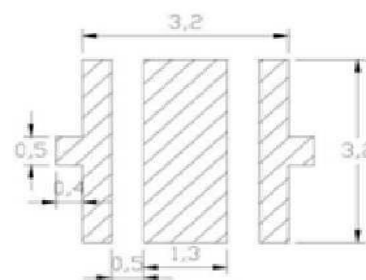
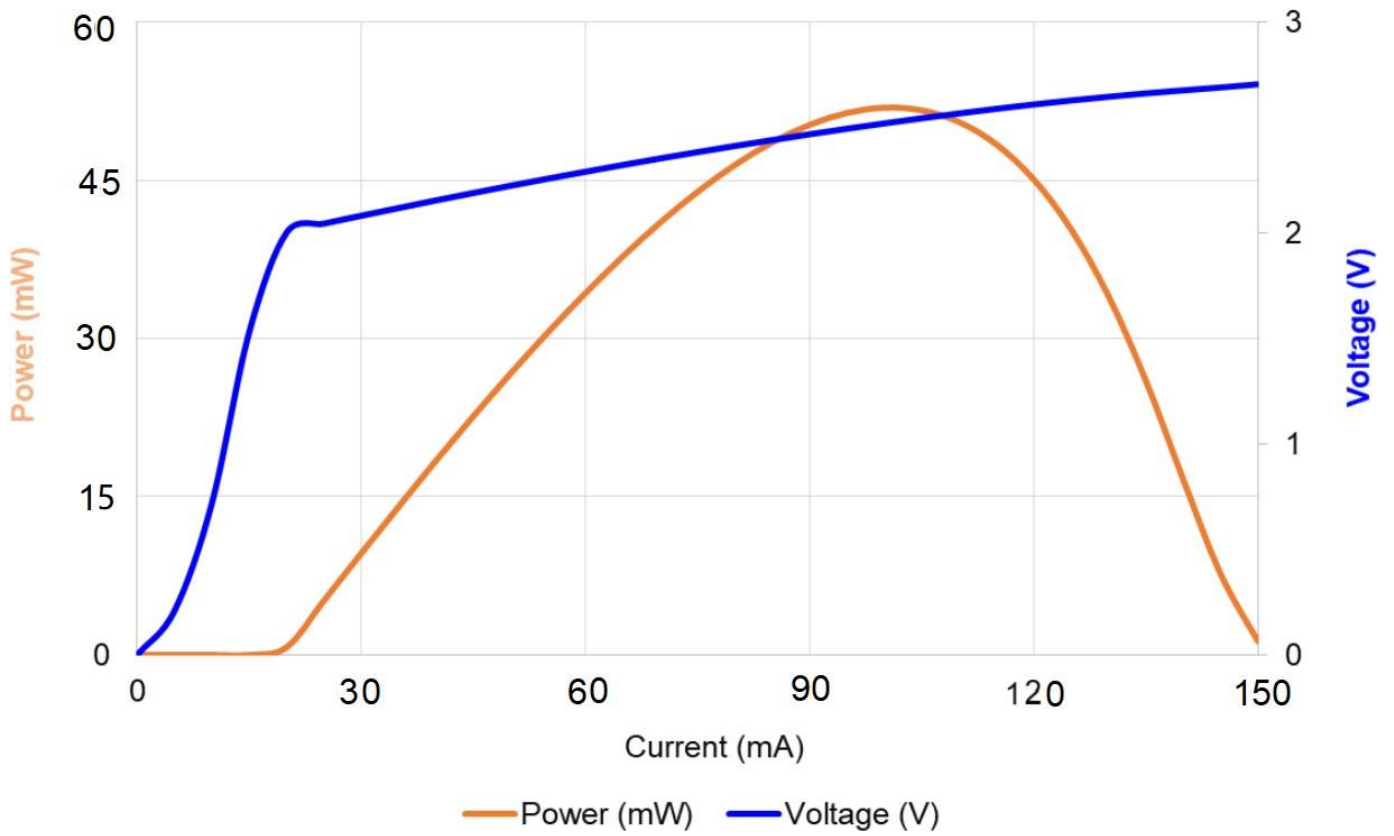


Figure 1: Package outline drawing.

Note: Unless otherwise noted, the tolerance =  $\pm 0.20$  mm.

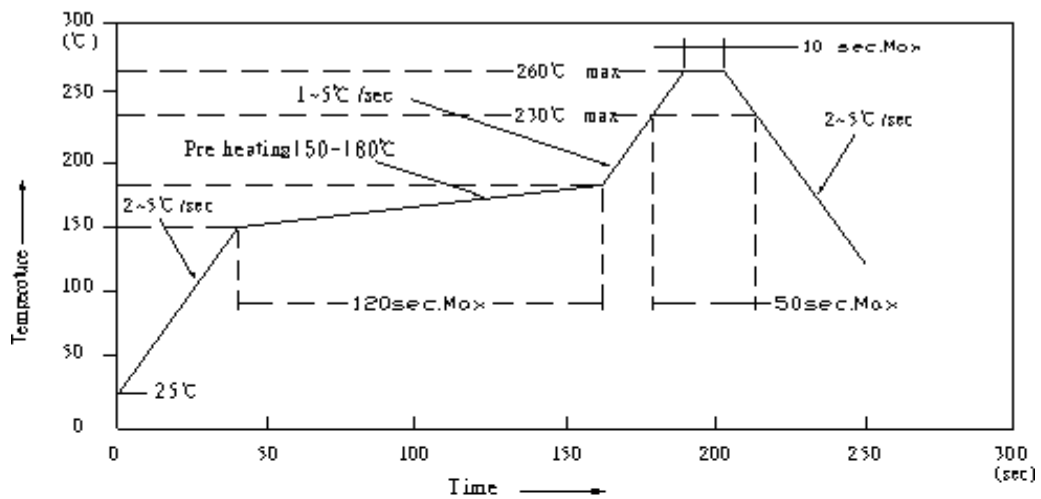
- § All dimensions are in millimeters.
- § Tolerance is  $\pm 0.20$  mm unless other specified.
- § Specifications are subject to change without notice.



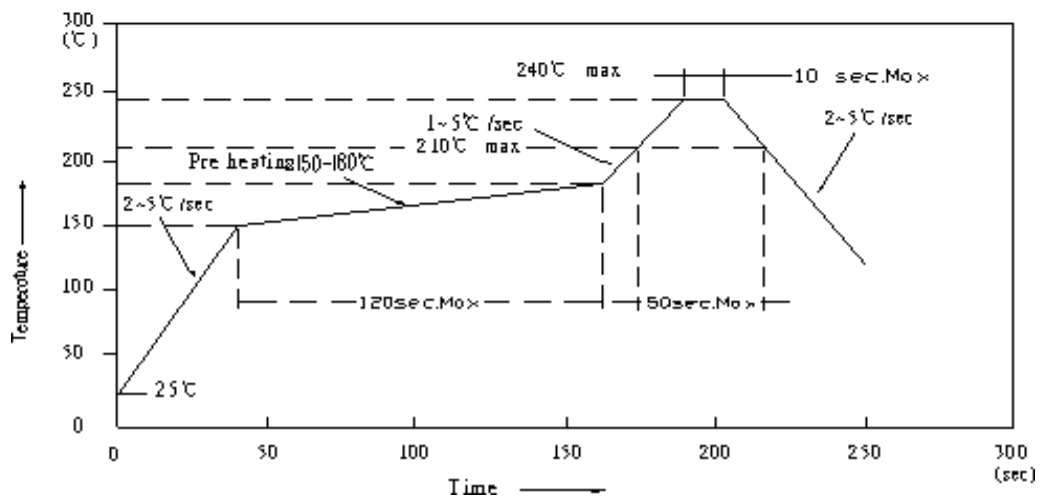
## Reflow Profile

### ■ Reflow Temp/Time

**IR Reflow Soldering Profile  
Lead Free Solder**



**IR Reflow Soldering Profile  
Lead Solder**



**NOTES:**

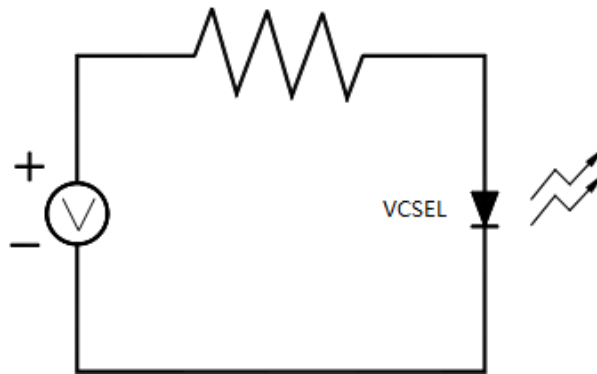
1. We recommend the reflow temperature 245°C (±5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the silicone resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

■ Soldering iron

Basic spec is  $\leq 5\text{sec}$  when  $260^\circ\text{C}$ . If temperature is higher, time should be shorter ( $+10^\circ\text{C} \rightarrow -1\text{ sec}$ ). Power dissipation of iron should be smaller than  $15\text{W}$ , and temperatures should be controllable. Surface temperature of the device should be under  $230^\circ\text{C}$ .

**Test circuit and handling precautions**

■ Test circuit



■ Handling precautions

1. Over-current-proof

Customer must apply resistors for protection; otherwise, slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 It is recommended to store the products in the following conditions:

Humidity: 60% R.H. Max.

Temperature:  $5^\circ\text{C} \sim 30^\circ\text{C}$  ( $41^\circ\text{F} \sim 86^\circ\text{F}$ )

2.2 Shelf life in sealed bag: 12 months at  $< 5^\circ\text{C} \sim 30^\circ\text{C}$  and  $< 30\%$  R.H. after the package is opened, the products should be used within a week or they should be keeping to store at  $\leq 20$  R.H. with zip-lock sealed.

3. Baking

It is recommended to baking before soldering when the pack is unsealed after 24hrs. The Conditions are as followings:

3.1  $60 \pm 3^\circ\text{C}$  x(12~24hrs) and  $< 5\%$  RH, taped reel type

3.2  $100 \pm 3^\circ\text{C}$  x(45min~1hr), bulk type

3.3  $130 \pm 3^\circ\text{C}$  x(15~30min), bulk type

Type	Test Item	Test Standard	Test Conditions	Note	Number of Damaged
Environmental Sequence	Temperature Cycle	JEITA ED-4701 300 303	-40°C 30min ↑↓5 min 100°C 30min	100 cycles	0/50
	Thermal Shock	JEITA ED-4701 200 303	0°C 15sec ↑↓5sec 100°C 15sec	20 cycles	0/22
	High Humidity Heat Cycle	JEITA ED-4701 200 203	25°C ↔ 65°C ↔ -10 °C 90% RH; 24hrs/1cycle	10 cycles	0/22
	High Temperature Storage	JEITA ED-4701 200 201	T <sub>a</sub> =100°C	1000 hrs	0/22
	Humidity Heat Storage	JEITA ED-4701 100 103	T <sub>a</sub> =60°C RH=90%	1000 hrs	0/22
	Low Temperature Storage	JEITA ED-4701 200 202	T <sub>a</sub> =-40°C	1000 hrs	0/22
Operation Sequence	Life Test	Tested with Brightek standard	T <sub>a</sub> =25°C I <sub>F</sub> =150mA	1000 hrs	0/22
	High Humidity Heat Life Test	Tested with Brightek standard	85°C RH=85% I <sub>F</sub> =80mA	500 hrs	0/22
	Low Temperature Life Test	Tested with Brightek standard	T <sub>a</sub> =-20°C I <sub>F</sub> =120mA	1000 hrs	0/22