

SXL Series 850nm 6W VCSEL Diode

P/N: SXL-LD-0850-C006-0025CA-XXXX

Features

- 850nm wavelength
- Low wavelength drift
- Oxide isolation technology
- Low threshold current
- High reliability
- Easy to collimate

Applications

- 3D sensors
- Lidars
- IR illuminations
- Medical applications
- Machining vision

I. Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Case Operating Temp	T _{op}	-40 to 85	°C
Storage Temp	T _{sto}	-40 to 105	°C
Reflow Soldering Temperature	T _{sdr}	260°C(10s)	°C
Reverse Voltage	V _r	5	V
Maximum Pulsed Current	I _{max}	12	A
ESD exposure (Human body) model	ESD	8-10K (Class 3)	V
ESD exposure (Machine) model	ESD	800-1000 (Class C)	V

Note:

1. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or other conditions above those indicated in the operations section for extended periods of time may affect reliability.
2. In its maximum rating diode laser operation could damage its performance or cause potential safety hazard such as equipment failure.
3. Electrostatic discharge is the main reason for the laser fault of the diode. Take effective precautions against ESD. When dealing with laser diodes, use the wrist strap, grounding work surface and strict antistatic technology.

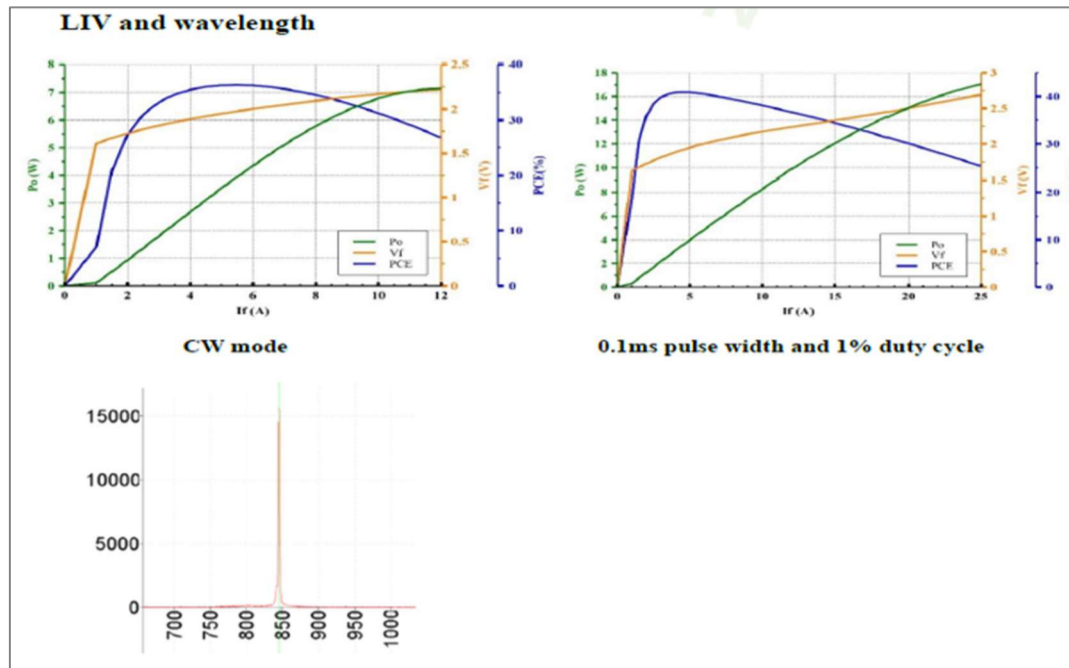
II. Optical-electrical characteristics @25°C, CW mode

Parameters	Symbol	Conditions	Min.	Typ.	Max.	Unit
CW mode						
Threshold Current	I _{th}		-	1	-	A
Forward Current	I _F		-	8.5	-	A
Optical Power	P _o	I _F =8.5A	-	6	-	W
Laser Forward Voltage	V _f	I _F =8.5A	-	2.11	-	V
Power conversion efficiency	η	I _F =8.5A	-	34	-	%
Slope efficiency	SE	P _o =6W	-	0.8	-	W/A
Series Resistance	R	I _F =8.5A	-	0.04	-	Ω
Pulse mode (0.1ms pulse width and 1% duty cycle)						
Threshold Current	I _{th}		-	1	-	A
Forward Current	I _F		-	20	-	A
Optical Power	P _o	I _F =20A	-	15	-	W
Laser Forward Voltage	V _f	I _F =20A	-	2.5	-	V
Power conversion efficiency	η	I _F =20A	-	30	-	%
Slope efficiency	SE	P _o =15W	-	0.94	-	W/A
Series Resistance	R	I _F =20A	-	0.033	-	Ω
Peak Wavelength	-	-	840	850	860	nm
Emission area	-	-	-	1146 x1134	-	um

Wavelength-Temp. Drift	$\Delta\lambda/\Delta T$	-	-	-	0.07	nm/°C
Beam divergence	FWHM	-	-	25	-	deg
Number of Aperture	-	-	-	1184	-	-
Soldering Temperature	-	-	-	-	260(10s)	°C
Substrate	AlN, Cu					

Note Electro-Optical Characteristic with a package or diffuser would require further evaluation. Values are based on limited sample size and estimated values.

III. Typical Performance

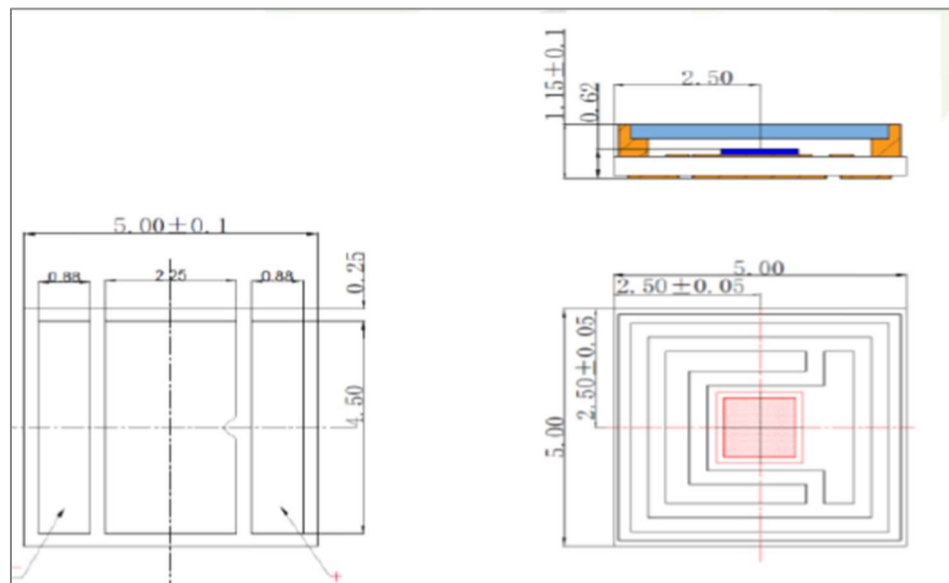


Note:

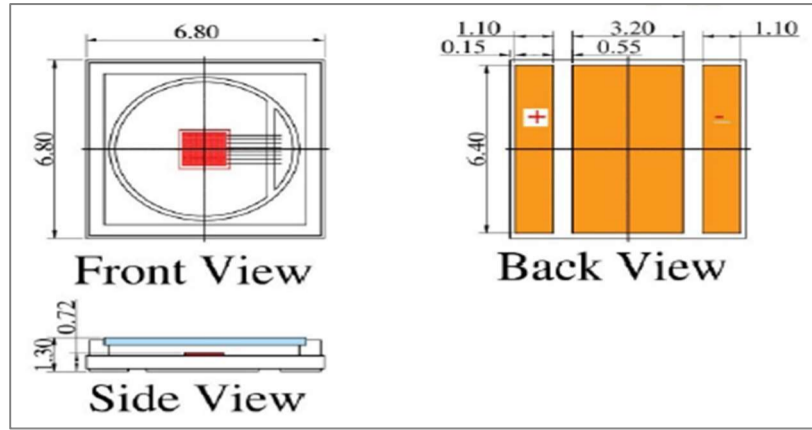
1. LIV graph was measured at 25 °C (left); power output, voltage and power conversion efficiency variation trend with changed operating temperature (right, normalized).
2. Forward Voltage (VF) measurement allowance is ± 0.1 V.
3. Peak Wavelength (λ_P) measurement allowance is ± 1.5 nm.
4. Other measurement allowance is $\pm 10\%$.

IV. Mechanical Schematics (unit: mm)

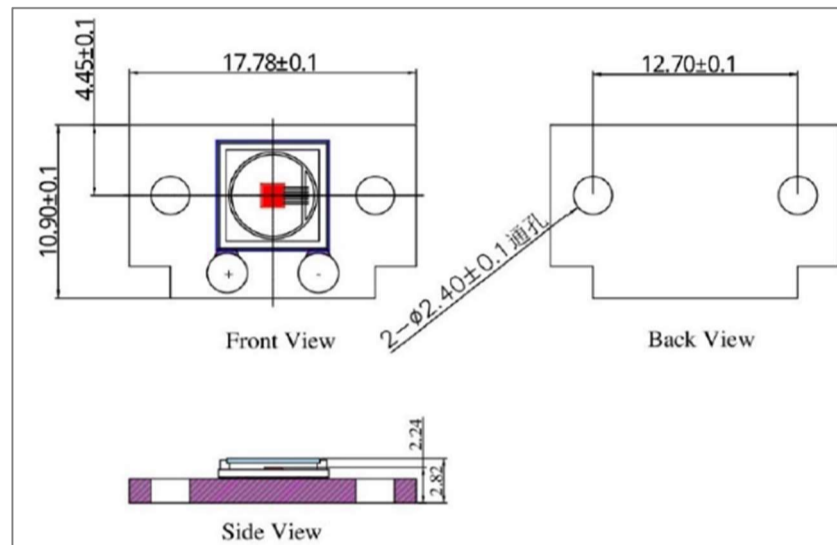
SXL-LD-0850-C006-0025CA-0104 (Substrate AlN, Package 5050)



SXL-LD-0850-C006-0025CA-0106 (Substrate AIN, Package 6868)

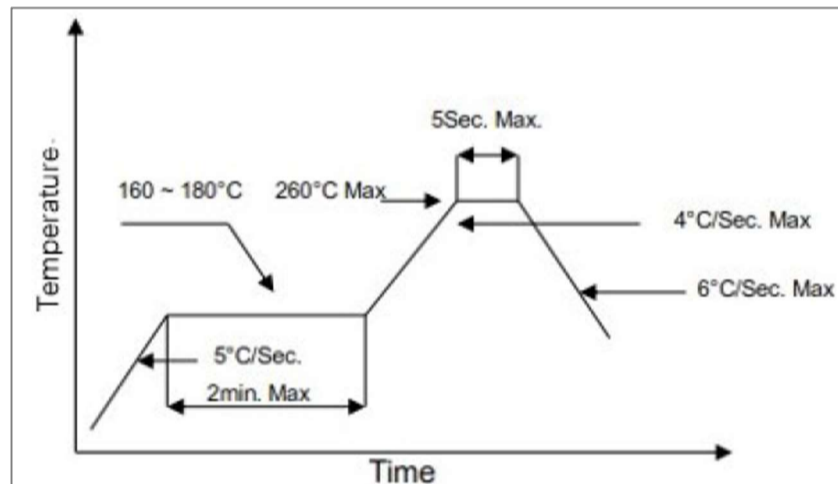


SXL-LD-0850-C006-0025CA-0611 (Substrate Cu, Package T-mount)



Note: There may be some changes between sample and drawing, thus the actual spec please refer to the sample that you received. And if any question please contact us.

V. SMT reflow soldering curve



Note: Reflow soldering can be operated only one time. During the temperature ramp-up, no forces may be exerted on the LD which could deform or damage them. After soldering completed, please also do not process until the product temperature ramp down to room temperature.

VI. Treatment and protection measures

Soldering precautions

The temperature of soldering iron must be controlled under 260°C during manual soldering. Also, VCSEL can be only soldered one time with the soldering time less than 3s. But, It is very hard to control the soldering temperature and homogenize solder paste because of the smaller size of VCSEL. In addition, it is easy to damage VCSEL structure even causes VCSEL losing efficacy. So, we advise you to use re-flow soldering machine for operation.

Storage precautions

Our products were sealed by aluminium foil bag attaching packed desiccant, they are moisture proof and anti-static. please handle these gently to avoid damage. At the same time, please be ready for storage and take some moisture-proof measures to keep VCSEL away from dampness that may causes reliability failure.

Before opening, VCSEL must be saved for at least 90 days below 30°C with 60%RH.

After opening, VCSEL must be kept in an environment that temperature lower than 30°C and humidity lower than 60%RH and used up within 24 hours. When the storage humidity reaches and exceeds 60%, the products must be dehumidified at 60°C for more than 24hours before use.

Others

1. Please use solder paste to cure the laser diode.
2. Please make sure that the heat of LD has been completely conducted to metal shell, to avoid affecting the optical power output.
3. This LD can be only used in constant voltage and current.
4. Operating voltage and current, refer to the table in paragraph II.
5. Please do not aim the laser to people or animal.
6. You can observe the laser spot through an image monitoring equipment.
7. Please do not touch LD surface by naked hands or squeeze the sealant on LD surface, or it may cause wrong optical angle and distorted laser spot, even damage the LD.
8. Please use ceramic suction nozzle to absorb the LD, so as to avoid LD sticking to the nozzle.
9. Please add a 0.02s blowing action after locating the laser diode to aluminium substrate.