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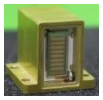
Data Sheet
Rev 01.0621

850nm 200W Pulsed VCSEL Diode with Diffuser in 2511 SMD Package

VCD25A-850P200WE-C



Description

The Lasermate VCD25A-850P200WE-C is an 850nm wavelength, 200W output power, pulsed operating mode, Vertical Cavity Surface Emitting Laser (VCSEL) diode with diffuser in 2511 surface mount (SMD) package with water cooling case designed for use in sensing applications.

Features

- Surface mount SMD package with Diffuser
- Single longitudinal mode
- Low wavelength drift
- Circular spot
- High reliability
- Easy to collimate
- 200W 850nm VCSEL @ 36A, pulse width 100ms

Applications

- 3D sensors
- Pump source of solid-state laser
- Scanning LiDAR
- Laser machining
- Cosmetics i.e., Hair removal

Product Overview

The following table lists the available part numbers, as well as the package type and diffuser beam angle of each of the part numbers.

Part Number	Package	Diffuser Beam Angle
VCD25A-850P200WE-C	2511 Package, Substrate AlN	120°x90°

Specifications

Absolute Maximum Ratings				
Parameters	Symbol	Rating	Unit	Conditions
Case Operating Temperature	Top	-40 to 85	°C	
Storage Temperature	Tstg	-40 to 105	°C	
Reflow Soldering Temperature	Tsol	180	°C	10 seconds
Reverse Voltage	Vr	22	V	
Maximum Continuous Current	Imax	55	A	
ESD Exposure (Human Body) Model	ESD	2k-4k (Class 2)	V	
ESD Exposure (Machine) Model	ESD	200-400 (Class B)	V	

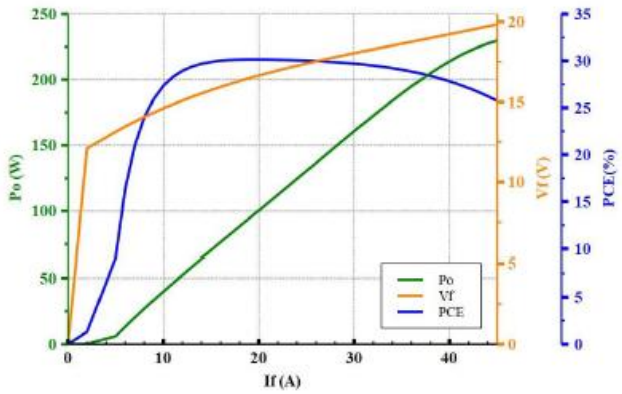
Notes:

- 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 expanded periods of time may affect reliability.
- In its maximum rating diode laser operation could damage its performance or cause potential safety hazard such as equipment failure.
- Electrostatic discharge is the main reason for laser fault of the diode. Take effective precautions against ESD. When dealing with laser diodes, use wrist strap, grounding work surface and strict antistatic technology.

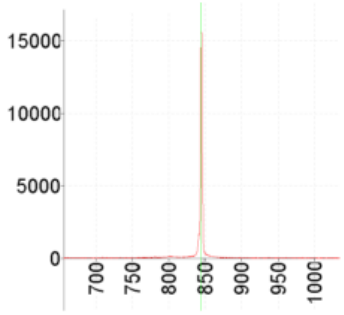
Electro-Optical Characteristics (T_{op}=25°C, Pulse width 100ms, Duty cycle 10%)							
Parameters		Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power		P_o	-	200	-	W	I_F=36A
Threshold Current		I_{th}	-	5	-	A	
Forward Current			-	36	-	A	
Slope Efficiency		η	-	5.5	-	W/A	
Power Conversion Efficiency		PCE	-	28	-	%	I_F=36A
Emission Area (without diffuser)			-	13x23	-	mm	
Peak Wavelength		λ_P	840	850	860	nm	P_o=200W
Forward Voltage		V_F	-	19	-	V	I_F=36A
Series Resistance		R_S	-	0.1	-	Ω	I_F=36A
Beam Angle with Diffuser	(1/e^2)	Θ	-	120x90	-	Deg	I_F=36A
	FWHM	Θ				Deg	I_F=36A
Wavelength Temperature Drift		$\Delta\lambda_P/\Delta T$	-	0.07	-	nm/°C	I_F=36A
Duty Cycle				10		%	
Soldering Temperature		Tsol			260	°C	10 seconds

Typical Characteristics

LIV Graph (Pulse mode at Pulse width 100ms, Duty Cycle 10%)

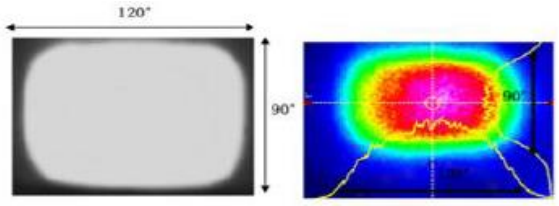


Intensity vs. Wavelength



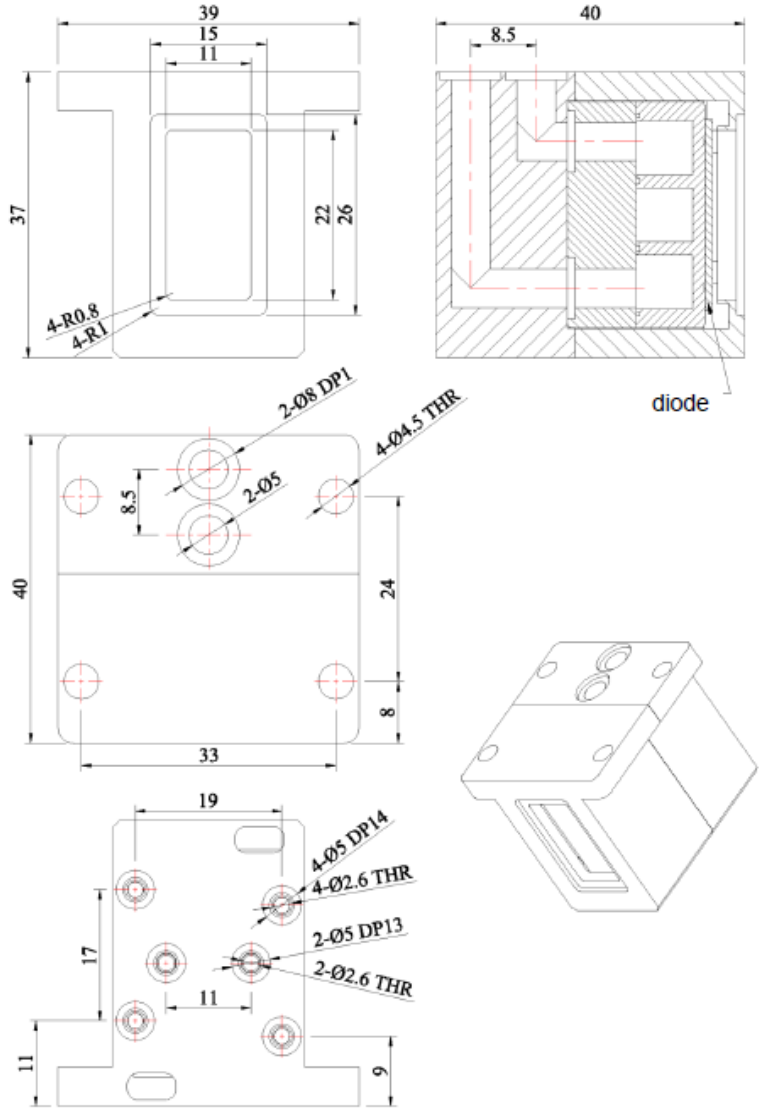
Typical Beam Profile with Diffuser

Beam angle: 120°x90°

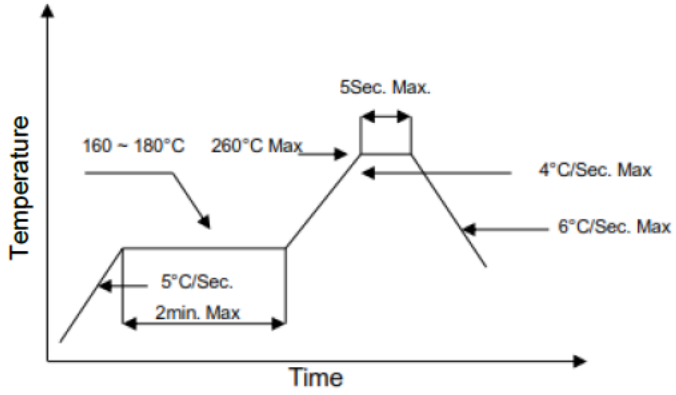


Outline Dimensions (unit: mm)

VCD25A-850P200WE-C (2511 SMD Package, AlN Substrate + Water Cooling Case)



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 would deform or damage them. After soldering is completed, please do not process until the product temperature ramps down to room temperature.

Additional Notes

1. Please use solder paste to cure the laser diode.
2. Please make sure that the heat of VCSEL diode has been completely conducted to metal shell to avoid affecting the optical power output.
3. This VCSEL diode can be only used in constant voltage and current.
4. Please do not aim the laser at people or animals.
5. You may observe the laser spot through an image monitoring equipment.
6. Please do not touch VCSEL diode surface by naked hands or squeeze the sealant on VCSEL diode surface. It may cause wrong optical angle and distorted laser spot, and even damage the VCSEL diode.
7. Please use ceramic suction nozzle to absorb the VCSEL diode, so as to avoid VCSEL diode sticking to the nozzle.
8. Please add a 0.02s blowing action after locating the laser diode to aluminum substrate.
9. Specifications are subject to change without notice.

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