



# VCD35A-850P4Wx

## 850nm 4000mW VCSEL with Diffuser

Data Sheet

### Features

- 850nm oxide-confined VCSEL
- Output power: 4W (pulsed)
- SMD 3535 package with integrated diffuser
- Good thermal conduction
- High reliability



### Applications

- 3D sensors
- Proximity sensing
- IR illumination
- Lidar systems
- Medical diagnostics and scanning

### Ordering Information

Part Number	Description
VCD35A-850P4WA	850nm 4000mW VCSEL with 60°x45° Diffuser
VCD35A-850P4WB	850nm 4000mW VCSEL with 72°x58° Diffuser
VCD35A-850P4WC	850nm 4000mW VCSEL with 90°x70° Diffuser
VCD35A-850P4WD	850nm 4000mW VCSEL with 110°x85° Diffuser
VCD35A-850P4WE	850nm 4000mW VCSEL with 120°x90° Diffuser

\* Other diffuser options may be available upon request.

### 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	260	°C	10 seconds
Reverse Voltage	Vr	5	V	
Maximum Continuous Current	I <sub>max</sub>	6	A	
ESD Exposure (Human Body) Model	ESD	2K	V	

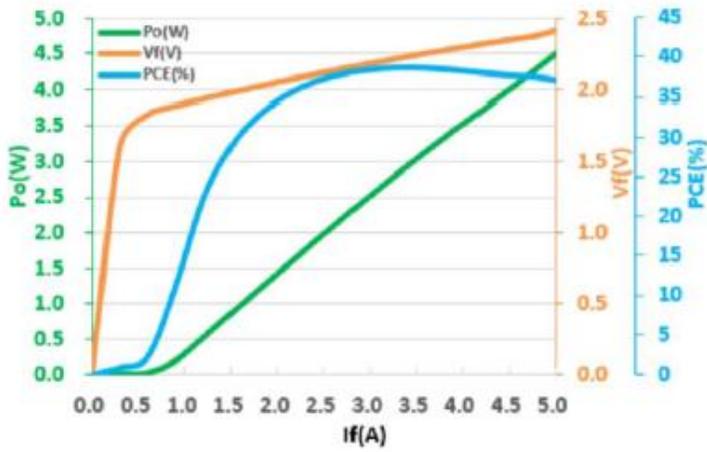
### Electrical-Optical Characteristics (T<sub>op</sub>=25°C, Pulse width 0.1ms, Duty cycle 1%)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power	P <sub>o</sub>	-	4.0	-	W	I <sub>F</sub> =4.5A
Threshold Current	I <sub>th</sub>	-	600	-	mA	
Forward Current	I <sub>F</sub>	-	4.5	-	A	
Peak Wavelength	λ <sub>p</sub>	840	850	860	nm	I <sub>F</sub> =4.5A
Forward Voltage	V <sub>F</sub>	-	2.3	-	V	I <sub>F</sub> =4.5A
Power Conversion Efficiency	PCE	-	39	-	%	I <sub>F</sub> =4.5A
Slope Efficiency	η	-	1.03	-	W/A	P <sub>o</sub> =4W
Series Resistance	R <sub>S</sub>	-	0.51	-	Ω	I <sub>F</sub> =4.5A
Wavelength Temperature Drift	Δλ <sub>p</sub> / ΔT	-	-	0.07	nm/°C	I <sub>F</sub> =4.5A
Beam Divergence (without diffuser)	FWHM <sub>B</sub>	-	30	-	deg	

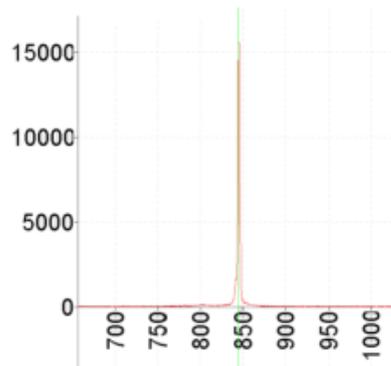
Note: Electro-optical characteristic with a package or diffuser would require further evaluation. Values are based on limited sample size and estimated values.

Typical Characteristics

LIV Graph

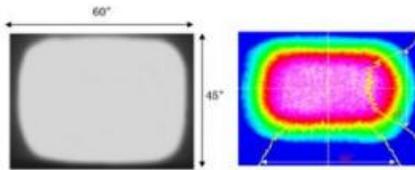


Intensity vs. Wavelength

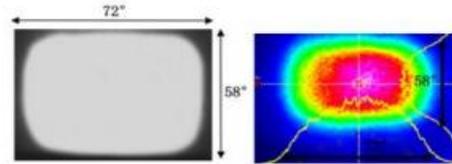


Typical Beam Profile with Diffuser

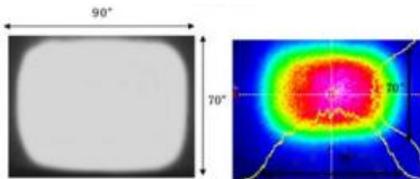
Beam angle: 60°x45°



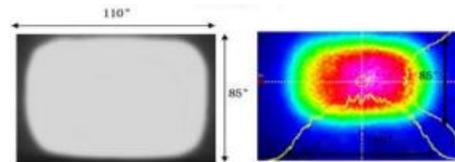
Beam angle: 72°x58°



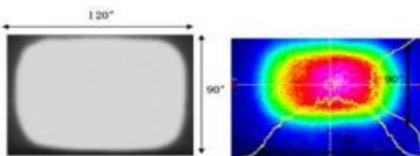
Beam angle: 90°x70°



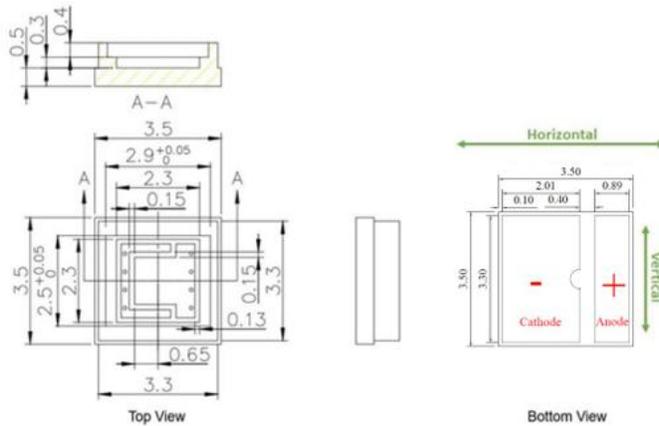
Beam angle: 110°x85°



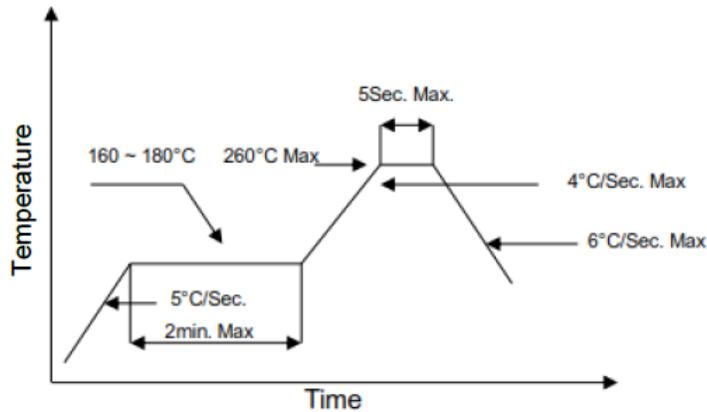
Beam angle: 120°x90°



## Outline Dimensions (unit: mm)



## 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. Stresses exceeding those listed in Absolute Maximum Ratings may cause permanent damage to the device. These ratings are stress limits only and do not imply functional operation under such conditions. Exposure to conditions beyond recommended operating limits may affect device reliability.
2. Operation at or near maximum ratings may degrade performance and may create potential safety risks, including device failure.
3. The device is sensitive to electrostatic discharge (ESD). Proper ESD precautions, including grounded wrist straps, antistatic work surfaces, and ESD-safe handling procedures, must be followed during handling and assembly.
4. Adequate thermal management must be provided. The VCSEL device should be properly mounted to ensure efficient heat transfer to the package or system thermal path to maintain stable optical performance.
5. Avoid direct exposure of laser radiation to human eyes or skin. Follow applicable laser safety regulations and system-level safety design practices.
6. The emitting surface of the VCSEL should not be touched or contaminated. Mechanical contact or contamination may degrade optical performance or damage the device.
7. Use appropriate pick-and-place handling tools, such as ceramic or ESD-safe vacuum nozzles, to prevent mechanical or electrostatic damage during assembly.
8. Specifications are subject to change without notice.