



850nm 2W Integrated VCSEL with Photodiode/Diffuser in 3535 Package

VCPD35A-850H2Wx



Description

The Lasermate VCPD35A-850H2Wx is an 850nm wavelength, 2000mW output power, pulsed operating mode, Vertical Cavity Surface Emitting Laser (VCSEL) diode integrated with photodiode and diffuser in surface mount (SMD) package designed for use in sensing applications.

Features

- 3535 package
- Low wavelength drift
- Oxide isolation technology
- Low threshold current
- High reliability and easy to collimate
- 2W 850nm VCSEL @ 2.04A

Applications

- 3D sensor
- IR illumination
- Medical application
- Lidar
- Proximity sensor

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 |
|-----------------|-----------------------------|---------------------|
| VCPD35A-850H2WA | 3535 Package, Substrate AlN | 60°x45° |
| VCPD35A-850H2WB | 3535 Package, Substrate AlN | 72°x58° |
| VCPD35A-850H2WC | 3535 Package, Substrate AlN | 90°x70° |
| VCPD35A-850H2WD | 3535 Package, Substrate AlN | 110°x85° |
| VCPD35A-850H2WE | 3535 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 | 260 | °C | 10 seconds |
| Reverse Voltage | Vr | 5 | V | |
| Maximum Continuous Current | I _{max} | 3 | A | |
| ESD Exposure (Human Body) Model | ESD | 2K | 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.

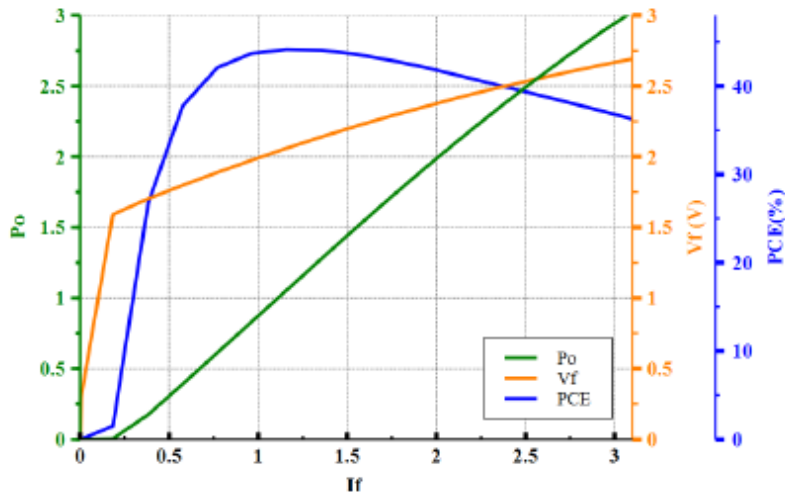
| Electro-Optical Characteristics (T _{op} =25°C, 10% Duty cycle) | | | | | | |
|---|----------------------|------|-----------|------|-------|-----------------------|
| Parameters | Symbol | Min. | Typ. | Max. | Unit | Conditions |
| Optical Output Power | P _o | - | 2 | - | W | I _F =2.04A |
| Threshold Current | I _{th} | - | 0.25 | - | A | |
| Forward Current | I _F | - | 2.04 | - | A | |
| Power Conversion Efficiency | η | - | 41 | - | % | I _F =2.04A |
| Slope Efficiency | SE | - | 1.04 | - | W/A | P _o =2.0W |
| Peak Wavelength | λ _P | 840 | 850 | 860 | nm | I _F =2.04A |
| Forward Voltage | V _f | - | 2.38 | - | V | I _F =2.04A |
| Series Resistance | R | - | 0.33 | - | Ohm | I _F =2.04A |
| Original Beam Angle | Θ | - | 24 | - | Deg | I _F =2.04A |
| Wavelength Temperature Drift | Δλ _P / ΔT | - | 0.07 | - | nm/°C | I _F =2.04A |
| Emission Area | | - | 702 x 524 | - | um | |
| Rise/Fall Time | | - | 1 | - | ns | |
| Soldering Temperature | Tsol | | | 260 | °C | 10 seconds |
| Substrate | | | | | AlN | |

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

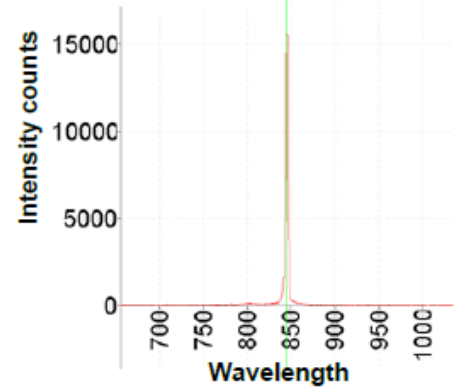
| Photodiode Specifications | | | |
|---------------------------|--------|-----------|--------------|
| Range | Filter | Substrate | Responsivity |
| 400-1100nm | No | Si | 0.97 @ 850nm |

Typical Characteristics

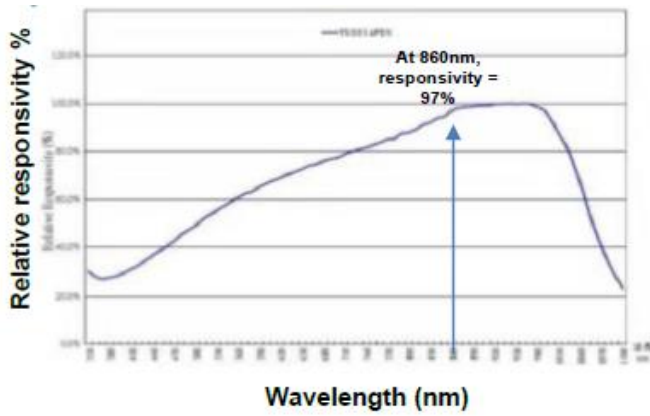
LIV Graph



Intensity vs. Wavelength

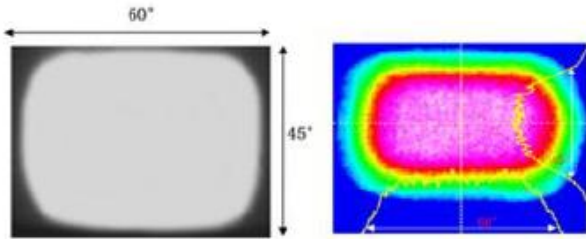


Photodiode Responsivity Chart

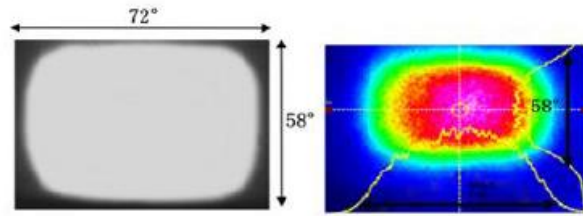


Typical Laser Spot and Beam Profile

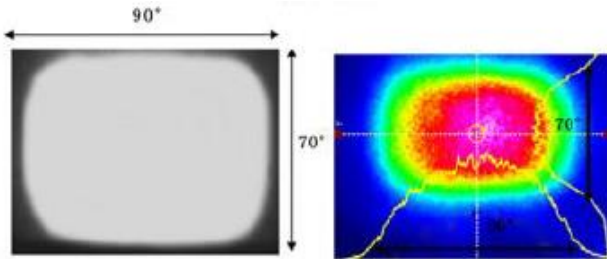
Beam angle: 60°x45°



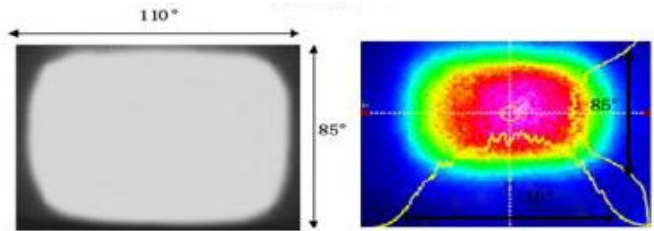
Beam angle: 72°x58°



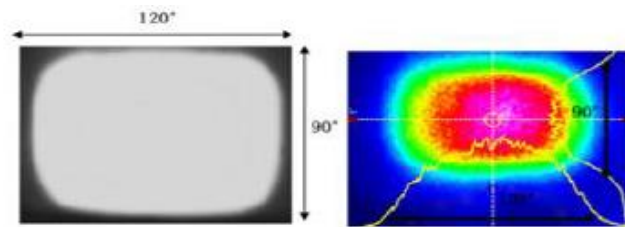
Beam angle: 90°x70°



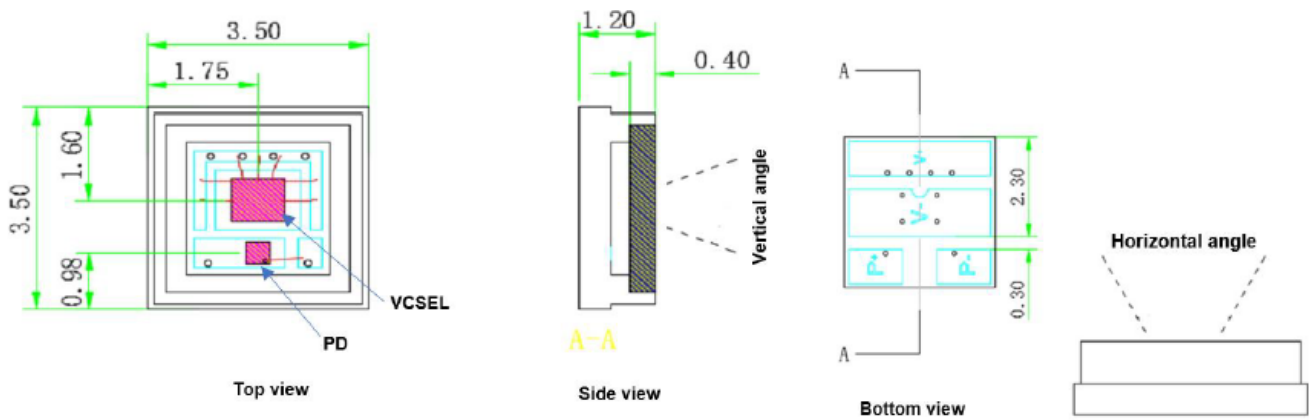
Beam angle: 110°x85°



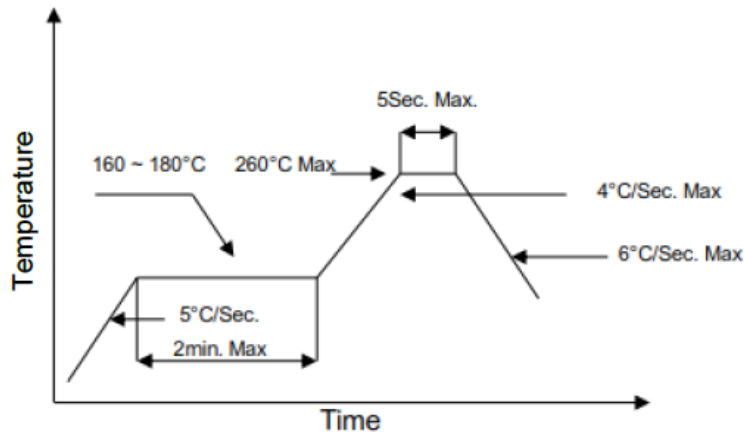
Beam angle: 120°x90°



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. 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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