



# VCx-850P25WA

## 850nm 25W Pulsed VCSEL Diode

Data Sheet

### Features

- 850nm VCSEL diode
- Peak optical output: 25W (ns pulse)
- Single wavelength emission
- Short rise time for fast pulsed response
- Good thermal conduction
- Available in SMD or TO-can package options

### Applications

- 3D sensing and detection
- Proximity sensors
- Scanning LiDAR systems
- Laser curtain barriers
- Range finder sensors
- Optical gesture recognition systems

### Ordering Information

| Part Number    | Description                                    |
|----------------|--|
| VC20A-850P25WA | 850nm 25W Pulsed VCSEL Diode, SMD 2016 Package |
| VCT5-850P25WA  | 850nm 25W Pulsed VCSEL Diode, TO-56 Package    |

### Absolute Maximum Ratings

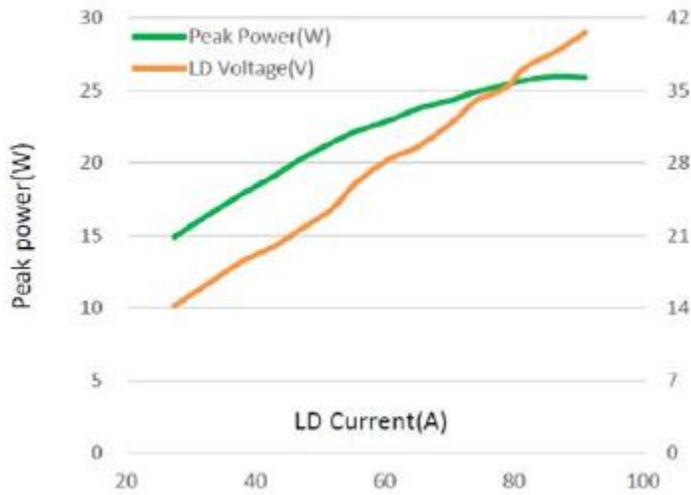
| Parameters                      | Symbol           | Rating     | Unit | Conditions          |
|---------------------------------|------------------|------------|------|---------------------|
| Case Operating Temperature      | Top              | -40 to 85  | °C   |                     |
| Storage Temperature             | Tstg             | -40 to 105 | °C   |                     |
| Reflow Soldering Temperature    | Tsol             | 260°C      | °C   | 10 seconds          |
| Reverse Voltage                 | Vr               | 5          | V    |                     |
| Maximum Continuous Current      | I <sub>max</sub> | 90         | A    | Duty cycle 0.1% max |
| ESD Exposure (Human Body) Model | ESD              | 2K         | V    |                     |

### Electrical-Optical Characteristics (T<sub>op</sub>=25°C, Pulse width 8.8ns at 11.68 kHz)

| Parameters                   | Symbol               | Min. | Typ.    | Max. | Unit  | Conditions          |
|------------------------------|----------------------|------|---------|------|-------|---------------------|
| Optical Output Power         | P <sub>o</sub>       | 20   | 25      | 30   | W     | I <sub>F</sub> =81A |
| Threshold Current            | I <sub>th</sub>      | -    | 0.1     | -    | A     |                     |
| Forward Pulse Current        |                      | -    | 81      | -    | A     |                     |
| Emission Area                |                      | -    | 370x371 | -    | um    |                     |
| Peak Wavelength              | λ <sub>P</sub>       | 840  | 850     | 860  | nm    | P <sub>o</sub> =25W |
| Pulse Forward Voltage        | V <sub>F</sub>       | 36   | 37      | 38   | V     | I <sub>F</sub> =81A |
| Series Resistance            | R <sub>S</sub>       | 0.44 | 0.46    | 0.47 | Ω     | I <sub>F</sub> =81A |
| Beam Angle                   | Θ                    | -    | 20      | -    | Deg   | I <sub>F</sub> =81A |
| Wavelength Temperature Drift | Δλ <sub>P</sub> / ΔT | -    | 0.07    | -    | nm/°C | I <sub>F</sub> =81A |
| Rise Time                    | Tr                   | -    | 2.8     | -    | ns    |                     |
| Duty Cycle                   |                      | -    | -       | 0.1  | %     |                     |
| Soldering Temperature        | Tsol                 |      |         | 260  | °C    | 10 seconds          |

### Typical Characteristics

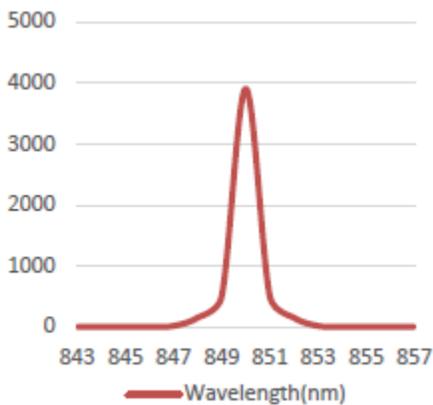
#### LIV Graph



#### Pulse width=8.8ns

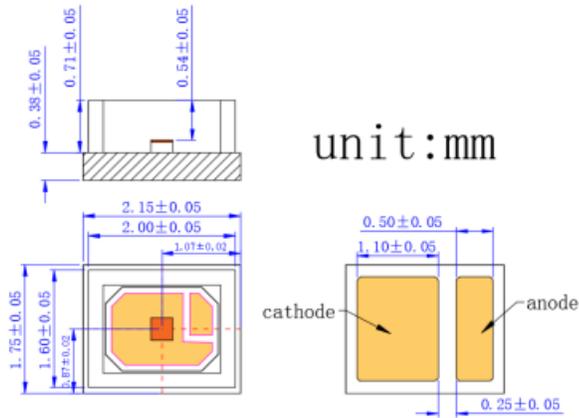


#### Intensity vs. Wavelength

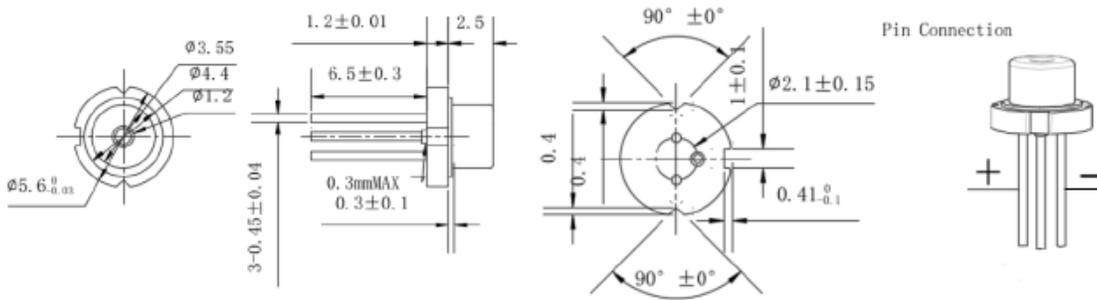


**Outline Dimensions (unit: mm)**

**SMD 2016 Package**



**TO-56 Package**



### 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.