



# VCAx-850P100WA

## 850nm 100W Multi-Channel VCSEL Array

### Data Sheet

#### Features

- 850nm multi-channel VCSEL array
- Output Power: 100W (nanosecond pulse)
- Single wavelength emission
- Good thermal conduction
- High reliability under pulsed operation

#### Applications

- 3D detection and face recognition
- Automotive and industrial lidar systems
- Proximity and gesture sensing
- Laser curtain safety systems
- Range finder and TOF-based systems
- Surveillance and vision enhancement modules

#### Ordering Information

| Part Number      | Description                               |
|------------------|-------------------------------------------|
| VCA4A-850P100WA  | 850nm 100W Multi-Channel VCSEL 1x4 Array  |
| VCA8A-850P100WA  | 850nm 100W Multi-Channel VCSEL 1x8 Array  |
| VCA16A-850P100WA | 850nm 100W Multi-Channel VCSEL 1x16 Array |

#### Absolute Maximum Ratings

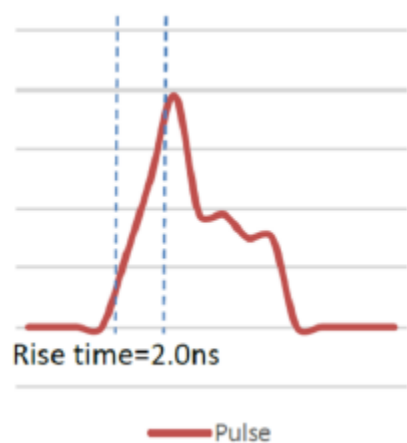
| Parameters                      | Symbol           | Rating            | Unit | Conditions          |
|---------------------------------|------------------|-------------------|------|---------------------|
| Case Operating Temperature      | Top              | -40 to 85         | °C   |                     |
| Storage Temperature             | Tstg             | -40 to 105        | °C   |                     |
| Reflow Soldering Temperature    | Tsol             | 260               | °C   | 10 seconds          |
| Reverse Voltage                 | Vr               | 50                | V    |                     |
| Maximum Continuous Current      | I <sub>max</sub> | 140               | A    | Duty cycle 0.1% max |
| ESD Exposure (Human Body) Model | ESD              | 2-4K (Class 2)    | V    |                     |
| ESD Exposure (Machine) Model    | ESD              | 200-400 (Class B) | V    |                     |

#### Electro-Optical Characteristics of Single Die (T<sub>op</sub>=25°C, Pulse width 6.2ns at 11.68 kHz)

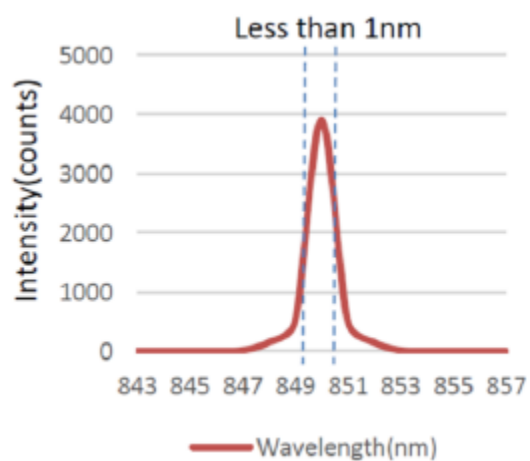
| Parameters                   | Symbol               | Min. | Typ.    | Max. | Unit  | Conditions          |
|------------------------------|----------------------|------|---------|------|-------|---------------------|
| Optical Output Power         | P <sub>o</sub>       | -    | 94      | -    | W     | I <sub>F</sub> =88A |
| Threshold Current            | I <sub>th</sub>      | -    | 1       | -    | A     |                     |
| Forward Pulse Current        |                      | -    | 88      | -    | A     |                     |
| Emission Area                |                      | -    | 354x355 | -    | um    |                     |
| Peak Wavelength              | λ <sub>P</sub>       | 840  | 850     | 860  | nm    | P <sub>o</sub> =94W |
| Pulse Forward Voltage        | V <sub>F</sub>       | -    | 50      | -    | V     | I <sub>F</sub> =88A |
| Series Resistance            | R <sub>s</sub>       | -    | 0.57    | -    | Ω     | I <sub>F</sub> =88A |
| Beam Angle                   | (1/e <sup>2</sup> )  | -    | 23      | 25   | Deg   | I <sub>F</sub> =88A |
|                              | FWHM                 | -    | 20      |      | Deg   | I <sub>F</sub> =88A |
| Wavelength Temperature Drift | Δλ <sub>P</sub> / ΔT | -    | 0.07    | -    | nm/°C | I <sub>F</sub> =88A |
| Soldering Temperature        | Tsol                 |      |         | 260  | °C    | 10 seconds          |

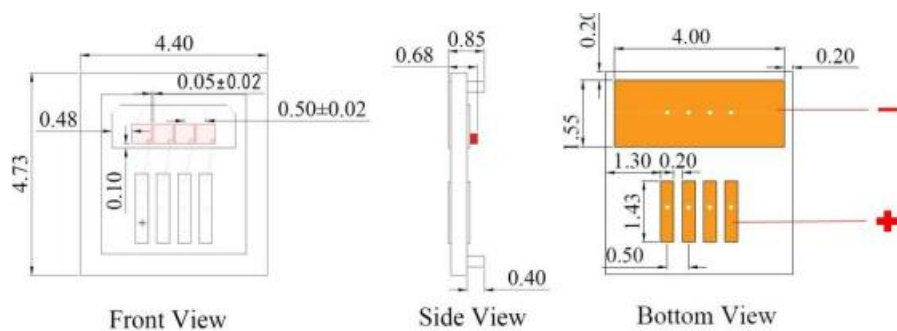
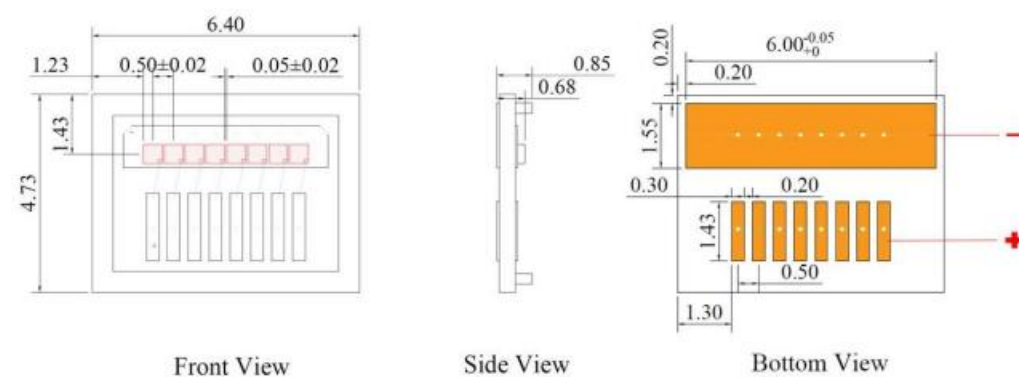
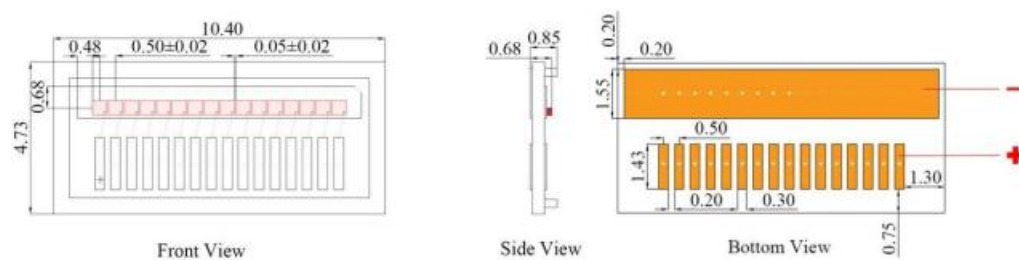
## Typical Characteristics

Pulse width=6.2ns

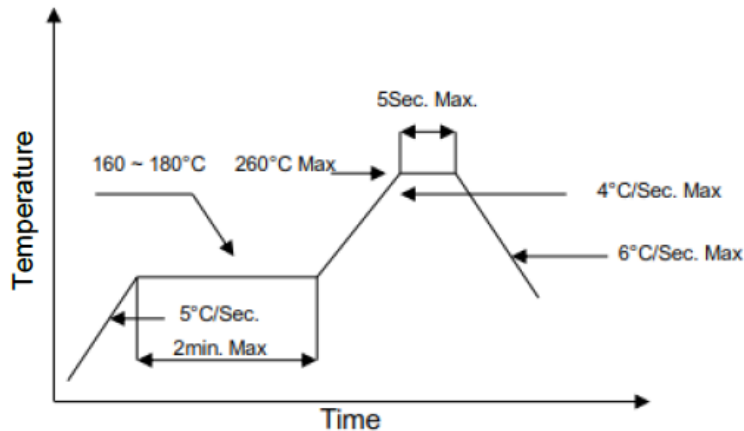


Intensity vs. Wavelength



**Outline Dimensions (unit: mm)****1x4 Array****1x8 Array****1x16 Array**

### 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.