VCAx-850P50WA
850nm 50W Multi-Channel VCSEL Array

Data Sheet

Features

- 850nm multi-channel VCSEL array
- Output Power: 50W (nanosecond pulse)
- Single wavelength emission
- Good thermal conduction
- Fast optical response (short rise time)

Applications

- 3D sensors and 3D detection systems
- Proximity sensing
- Scanning lidar
- Laser curtains and safety barriers
- Range finding and TOF systems
- Industrial and medical optical systems

Ordering Information

Part Number	Description
VCA4A-850P50WA	850nm 50W Multi-Channel VCSEL 1x4 Array
VCA8A-850P50WA	850nm 50W Multi-Channel VCSEL 1x8 Array
VCA16A-850P50WA	850nm 50W Multi-Channel VCSEL 1x16 Array

Absolute Maximum Ratings

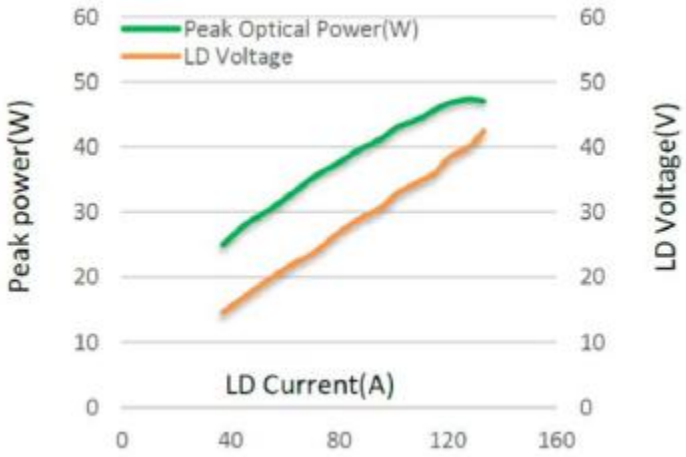
Parameters	Symbol	Rating	Unit	Conditions
Case Operating Temperature	Top	-40 to 85	°C	
Storage Temperature	Tstg	-40 to 105	°C	
Reflow Soldering Temperature	Tsol	260	°C	10 seconds
Reverse Voltage	Vr	5	V	
Maximum Continuous Current	Imax	180	A	Duty cycle 0.1% max
ESD Exposure (Human Body) Model	ESD	2K	V	

Electro-Optical Characteristics (T_{op}=25°C, Pulse width 6.2ns at 11.68 kHz)

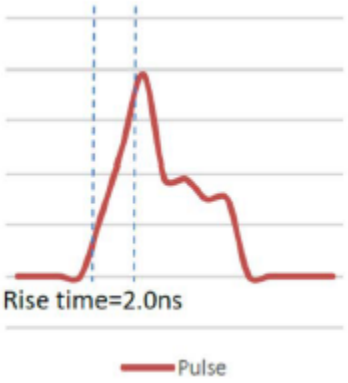
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power	P_o	40	50	52	W	I_F=120A
Threshold Current	I_{th}	-	0.1	-	A	
Forward Pulse Current		-	120	-	A	
Emission Area		-	370x371	-	um	
Peak Wavelength	λ_P	840	850	860	nm	P_o=50W
Pulse Forward Voltage	V_F	36	38	40	V	I_F=120A
Series Resistance	R_S	0.30	0.32	0.33	Ω	I_F=120A
Beam Angle	Θ	-	20	-	Deg	I_F=120A
Wavelength Temperature Drift	$\Delta\lambda_P/\Delta T$	-	0.07	-	nm/°C	I_F=120A
Rise Time	Tr	-	2	-	ns	
Soldering Temperature	Tsol			260	°C	5 seconds
Duty Cycle		-	-	0.1	%	

Typical Characteristics

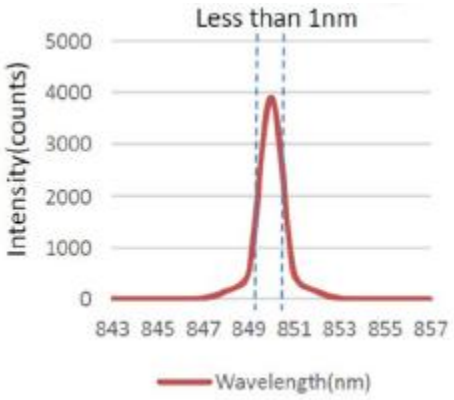
LIV Graph



Pulse width=6.2ns

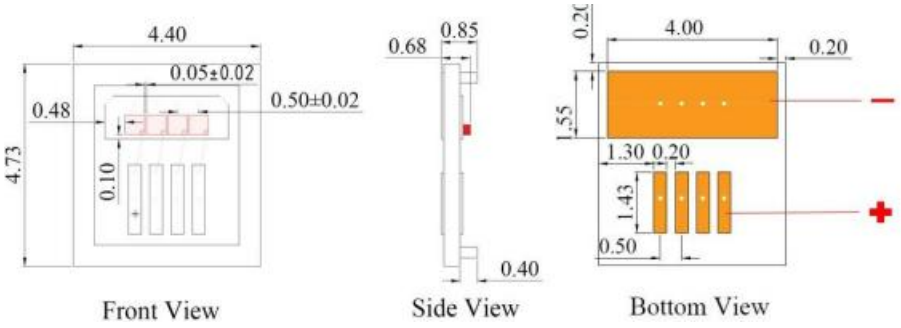


Intensity vs. Wavelength

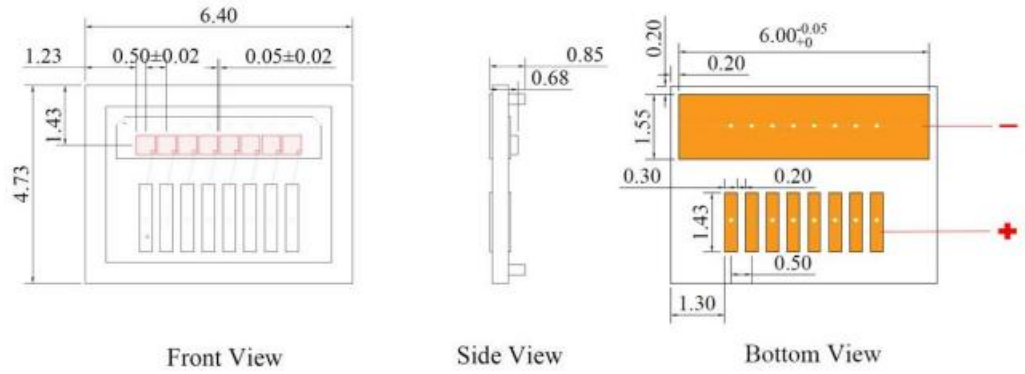


Outline Dimensions (unit: mm)

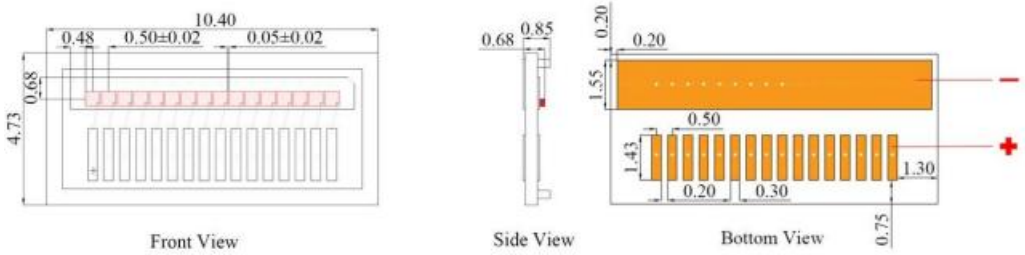
1x4 Array



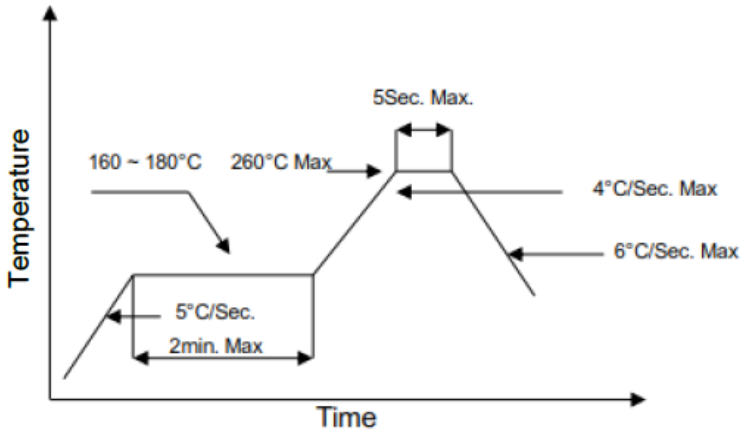
1x8 Array



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.