



VCT5-850C200B

850nm 200mW CW VCSEL in TO-56 Package with Monitor Photodiode

Data Sheet

Features

- 850nm oxide-confined VCSEL diode
- Output power: 200mW (CW)
- Low threshold current
- TO-56 package with integrated photodiode

Applications

- 3D sensing systems
- Proximity sensors
- Infrared illumination
- Range finder sensors
- Medical diagnostics and treatment devices

Absolute Maximum Ratings

Parameters	Symbol	Rating	Unit	Conditions
Case Operating Temperature	Top	-40 to 70	°C	
Storage Temperature	Tstg	-40 to 85	°C	
Reflow Soldering Temperature	Tsol	260	°C	10 seconds
Reverse Voltage	Vr	5	V	
Maximum Continuous Current	I _{max}	700	mA	
ESD Exposure (Human Body) Model	ESD	2-4K (Class 2)	V	
ESD Exposure (Machine) Model	ESD	200-400 (Class B)	V	

Electrical-Optical Characteristics (T_{op}=25°C, CW Mode)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power	P _o	-	200	-	mW	I _F =350mA
Threshold Current	I _{th}	-	50	-	mA	
Forward Current	I _F	-	350	-	mA	
Slope Efficiency	η	-	0.67	-	W/A	P _o =200mW
Power Conversion Efficiency	PCE	-	24	-	%	I _F =350mA
Peak Wavelength	λ _P	840	850	860	nm	I _F =350mA
Laser Forward Voltage	V _F	-	2.4	-	V	I _F =350mA
Series Resistance	R _S	-	1.66	-	Ω	I _F =350mA
Beam Divergence	FWHM _B	-	19	-	deg	
Wavelength Temperature Drift	Δλ _P /ΔT	-	-	0.07	nm/°C	I _F =350mA
Soldering Temperature				260	°C	10s

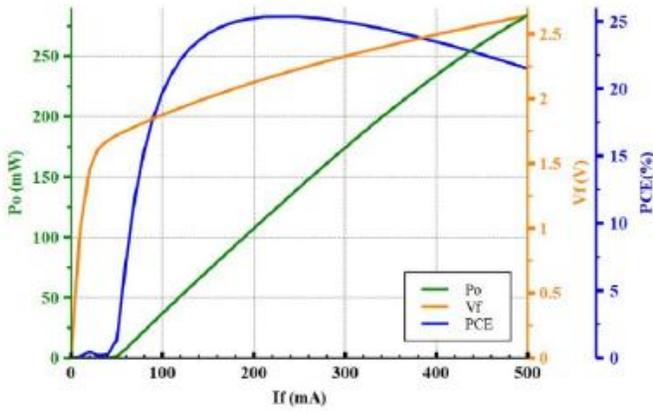
Photodiode Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V _F	0.5	-	1.3	V	I _F =10mA, E _e =0mW/cm ²
Reverse Breakdown Voltage	V _{BR}	35	-	-	V	I _{BR} =10uA, E _e =0mW/cm ²
Reverse Dark Current	I _D	-	-	10	nA	V _R =10V, E _e =0mW/cm ²
Light Current	-	-	2	-	uA	V _R =5V, 1mW/cm ² @940nm
Junction Capacitance	C _J	-	0.5	-	pF	V _R =3V, f=1MHz
Rise Time	Tr	-	1.7	-	ns	V _R =10V
Active Area	-	-	0.26x0.26	-	mm	

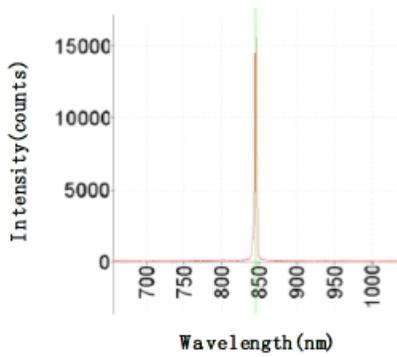
Note: Electro-optical characteristic with a package or diffuser would require further evaluation. Values are based on limited sample size and estimated values.

Typical Characteristics

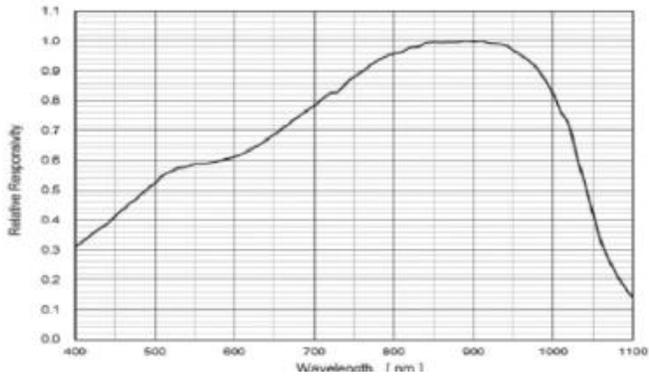
LIV Graph



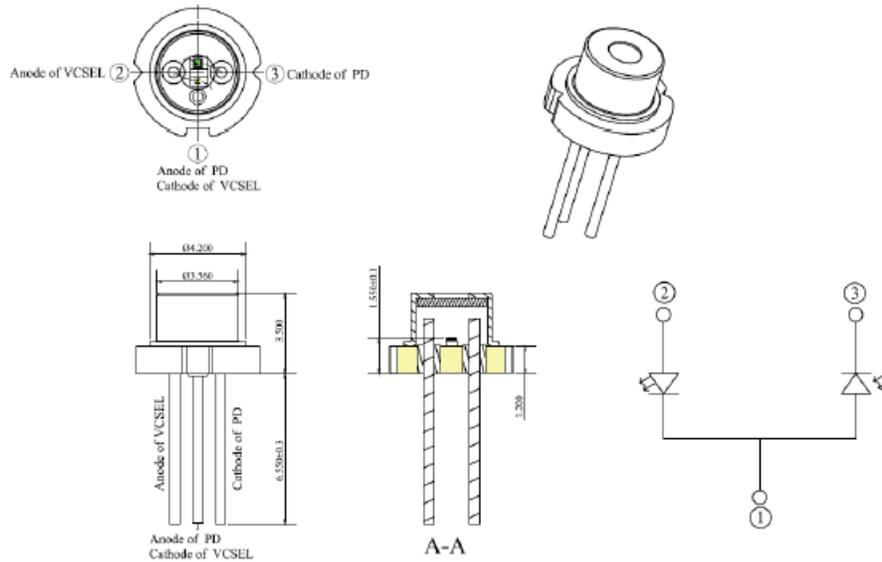
Intensity vs. Wavelength



Relative Responsivity vs. Wavelength



Outline Dimensions (unit: mm)



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.