



VCx-850C10A

850nm 10mW CW VCSEL Diode

Data Sheet

Features

- 850nm VCSEL diode
- Typical 10mW CW optical output power
- Modulation bandwidth >2GHz
- Low threshold current
- Oxide-confined VCSEL structure
- Available in SMD or TO-56 package options

Applications

- Proximity sensors
- Consumer electronics
- Active optical cables (AOCs)
- Medical diagnostics and monitoring
- Range finder sensors

Ordering Information

Part Number	Description
VC20A-850C10A	850nm 10mW CW VCSEL Diode, 2016 SMD Package
VCT5-850C10A	850nm 10mW CW VCSEL Diode, TO-56 Package

* Additional package configurations may be available upon request.

Absolute Maximum Ratings

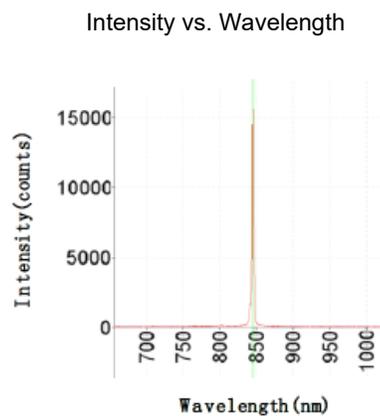
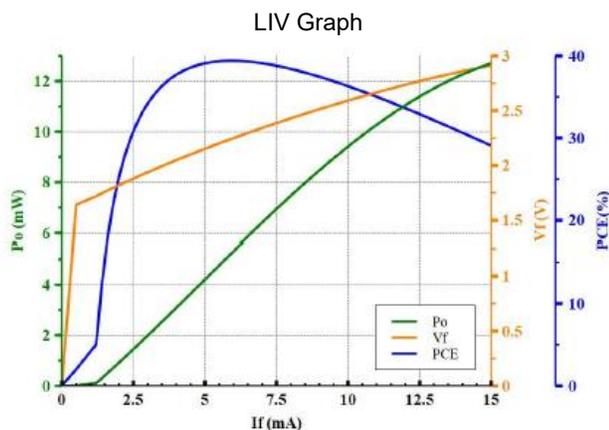
Parameters	Symbol	Rating	Unit	Conditions
Case Operating Temperature	Top	-25 to 70	°C	
Storage Temperature	Tstg	-40 to 85	°C	
Reflow Soldering Temperature	Tsol	260	°C	10 seconds
Reverse Voltage	Vr	5	V	
Maximum Continuous Current	I _{max}	20	mA	
ESD Exposure (Human Body) Model	ESD	2k-4k	V	Class 2
ESD Exposure (Machine) Model	ESD	200-400	V	Class B

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

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power	P _o	-	10	12	mW	I _F =11mA
Threshold Current	I _{th}	-	0.5	-	mA	
Forward Current	I _F	-	11	-	mA	
Slope Efficiency	η	-	1.0	-	mW/mA	
Power Conversion Efficiency	PCE	-	38	-	%	
Peak Wavelength	λ _P	840	850	860	nm	P _o =10mW
Laser Forward Voltage	V _F	-	2.5	2.7	V	I _F =11mA
Series Resistance	R _S	-	60	-	Ω	I _F =11mA
Beam Angle	(1/e ²)	-	23	-	deg	I _F =11mA
	FWHM	-	18	-		I _F =11mA
Wavelength Temperature Drift	Δλ _P / ΔT	-	0.07	-	nm/°C	I _F =11mA
Emission Area			Φ12		um	
Soldering Temperature				260	°C	10 seconds

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

Typical Characteristics

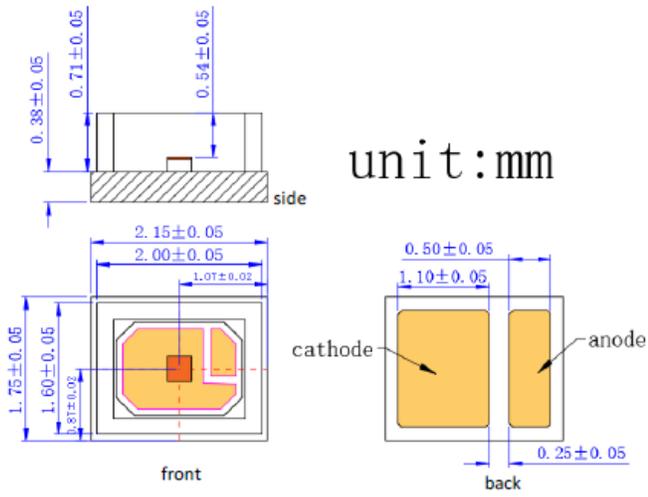


Notes:

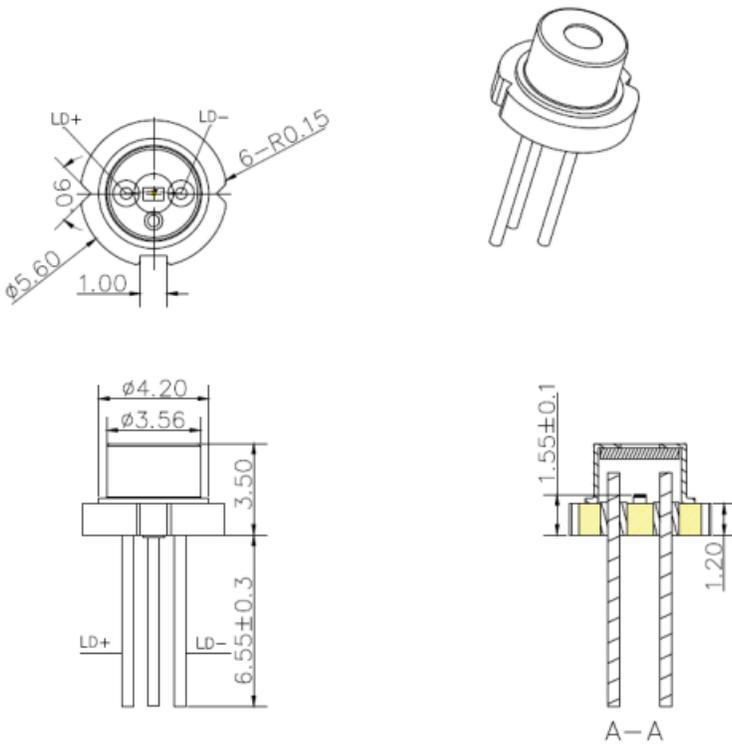
1. LIV graph was measured at 25°C (left); power output, voltage and power conversion efficiency variation trend with changed operating temperature (right, normalized).
2. Forward voltage (V_f) measurement allowance is $\pm 0.1V$.
3. Peak wavelength (λ_p) measurement allowance is $\pm 1.5nm$.
4. Others measurement allowance is $\pm 10\%$.

Outline Dimensions (unit: mm)

2016 SMD 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.