VCx-940C10A
940nm 10mW CW VCSEL Diode

Data Sheet

Features

- 940nm VCSEL Diode
- Typical 10mW CW optical output power
- Single longitudinal mode
- Low threshold current
- Modulation bandwidth >2GHz
- Available in SMD or TO-can package options

Applications

- Proximity sensors
- Consumer electronics (e.g., gesture control, face detection)
- Range finder sensors
- Medical diagnostics and monitoring
- Active optical cables (AOC)
- High-speed modulation systems

Ordering Information

Part Number	Description
VC20A-940C10A	940nm 10mW CW VCSEL Diode, 2016 SMD Package
VCT5-940C10A	940nm 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	Imax	20	mA	
ESD Exposure (Human Body) Model	ESD	2K	V	

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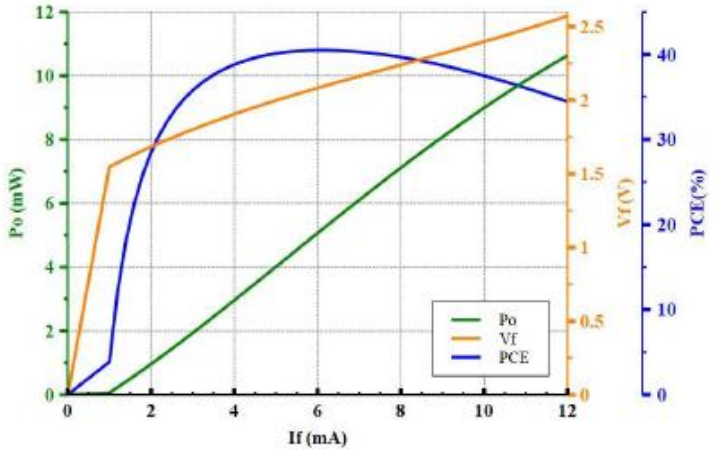
Electrical-Optical Characteristics (T_{op}=25°C, CW Mode)

Parameters		Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power		P_o	-	10	-	mW	I_F=11mA
Threshold Current		I_{th}	-	0.5	-	mA	
Forward Current		I_F	-	11	-	mA	
Slope Efficiency		η	-	0.94	-	mW/mA	P_o=10mW
Power Conversion Efficiency		PCE	-	35	40	%	I_F=11mA
Peak Wavelength		λ_P	930	940	950	nm	I_F=11mA
Laser Forward Voltage		V_F	-	2.5	-	V	I_F=11mA
Series Resistance		R_S	-	60	-	Ω	I_F=11mA
Beam Angle	(1/e^2)	Θ	-	20	-	deg	I_F=11mA
	FWHM	Θ		16		deg	
Wavelength Temperature Drift		$\Delta\lambda_P/\Delta T$	-	-	0.07	nm/°C	I_F=11mA
Soldering Temperature			-	-	260 (10s)	°C	

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

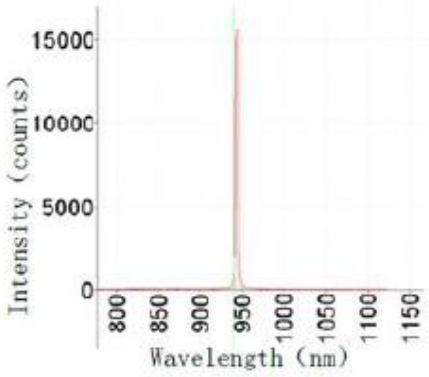
LIV Graph



Notes:

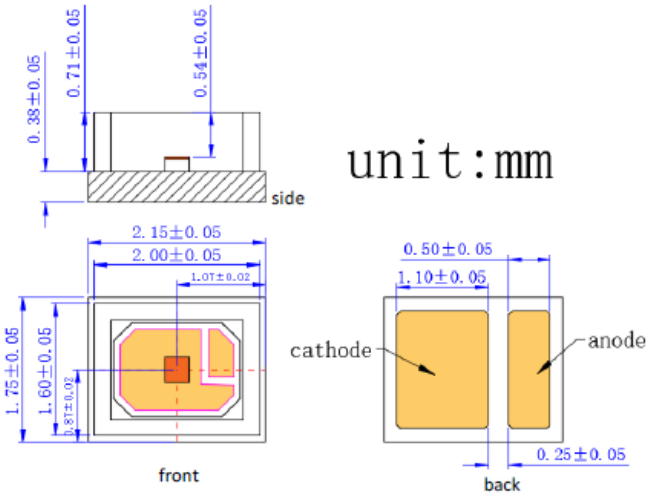
1. LIV graph was measured at 25°C (left).
2. Forward voltage (V_F) measurement allowance is ±0.1V.
3. Peak wavelength (λ_P) measurement allowance is ±1.5nm.
4. Others measurement allowance is ±10%.

Intensity vs. Wavelength

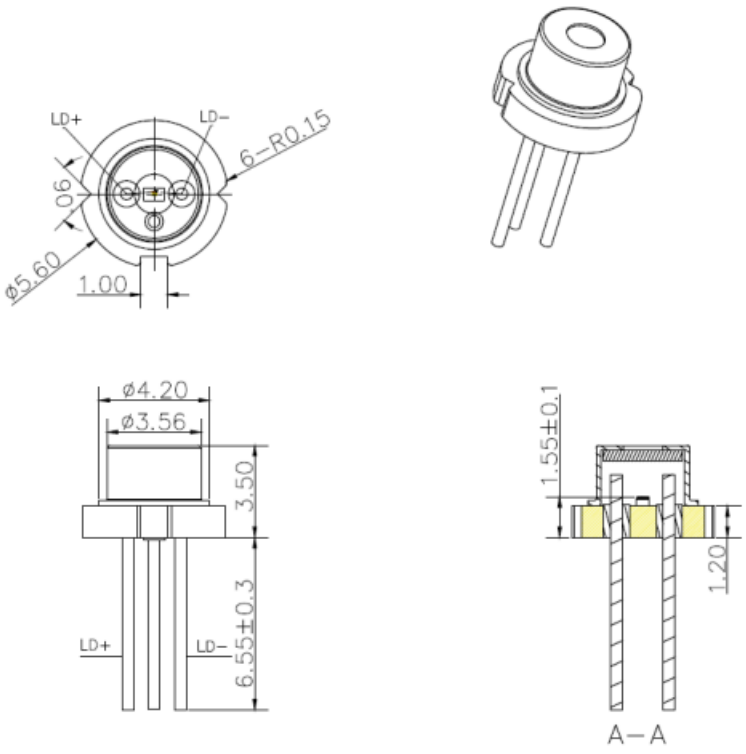


Outline Dimensions (unit: mm)

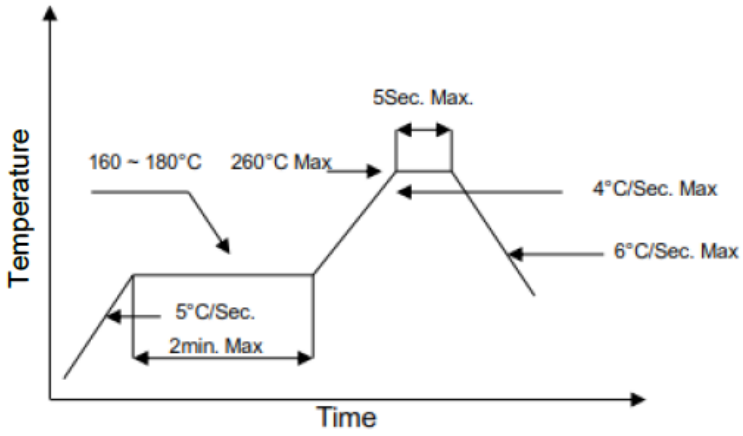
2016 SMD Package



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.