



850nm 10mW CW VCSEL Diode

VCx-850C10A



Description

The Lasermate VCx-850C10A is an 850nm wavelength, 10mW output power, CW operating mode, Vertical Cavity Surface Emitting Laser (VCSEL) diode. Available in different package types, the VCSEL is characterized by its single wavelength, good thermal conduction, oxide isolation technology, high reliability, and easy collimation. Designed for proximity sensors, consumer electronics, active optical cables, range finder sensor, and medical applications.

Features

- 850nm VCSEL Diode
- Output power: 10mW
- Single longitudinal mode
- Low wavelength drift
- Oxide isolation technology
- Low threshold current
- Small emission area
- Easy to collimate

Applications

- Proximity sensor
- Consumer electronics
- Active optical cables
- Medical application
- Range finder sensor
- Modulation bandwidth >2GHz

Product Overview

The following table lists the available part numbers, as well as the package type of each of the part numbers.

Part Number	Package
VC20C-850C10A	2016 Package, Substrate CuAg
VC20A-850C10A	2016 Package, Substrate AlN
VCT5-850C10A	TO-56 Package, Substrate NiFe
VCT-850C10A	TO-46 Package, Substrate NiFe

Specifications

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 (Class 2)	V	
ESD Exposure (Machine) Model	ESD	200-400 (Class B)	V	

Notes:

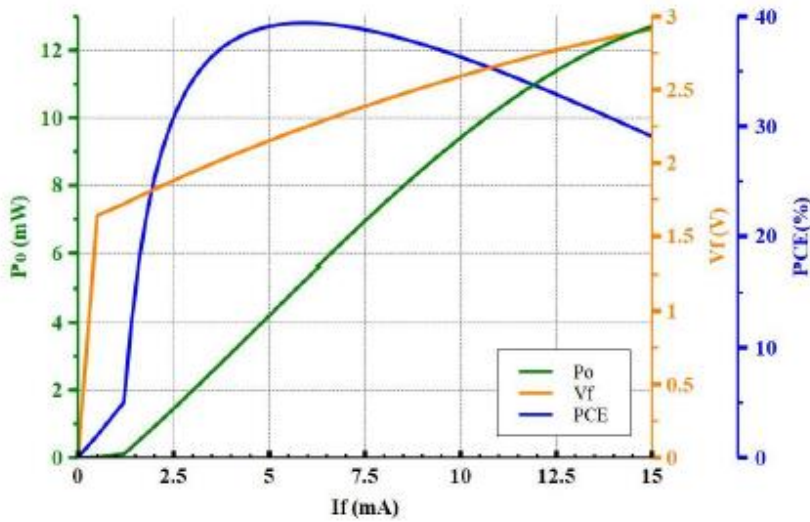
- Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or other conditions above those indicated in the operations section for expanded periods of time may affect reliability.
- In its maximum rating diode laser operation could damage its performance or cause potential safety hazard such as equipment failure.
- Electrostatic discharge is the main reason for laser fault of the diode. Take effective precautions against ESD. When dealing with laser diodes, use wrist strap, grounding work surface and strict antistatic technology.

Electro-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)	θ	-	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 (10s)	°C	AlN, FeNi Alloy	
				180 (10s)	°C	CuAg	

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

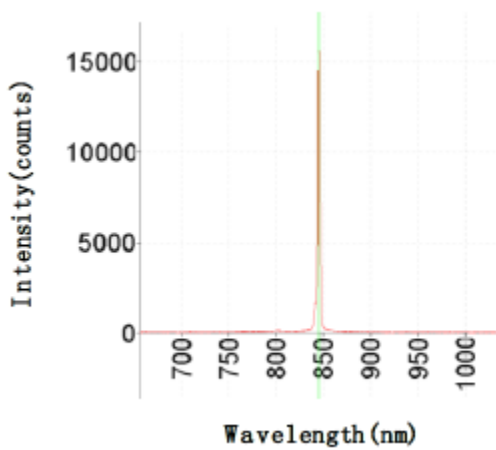
LIV Graph



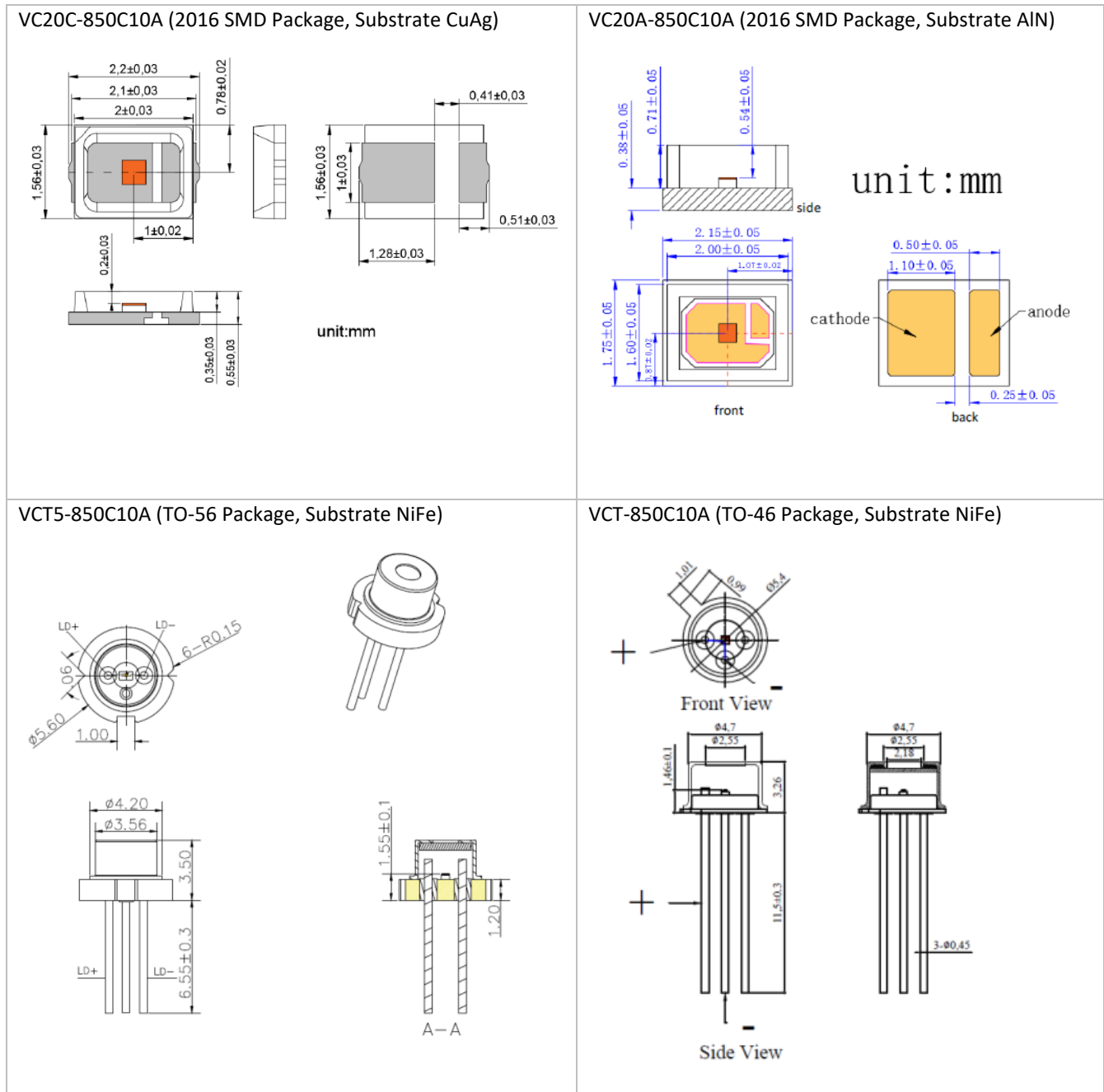
Notes:

1. LIV graph was measured at 25°C (left).
2. Forward voltage (V_f) measurement allowance is $\pm 0.1V$.
3. Peak wavelength (λ_p) measurement allowance is $\pm 1.5nm$.
4. Others measurement allowance is $\pm 10\%$.

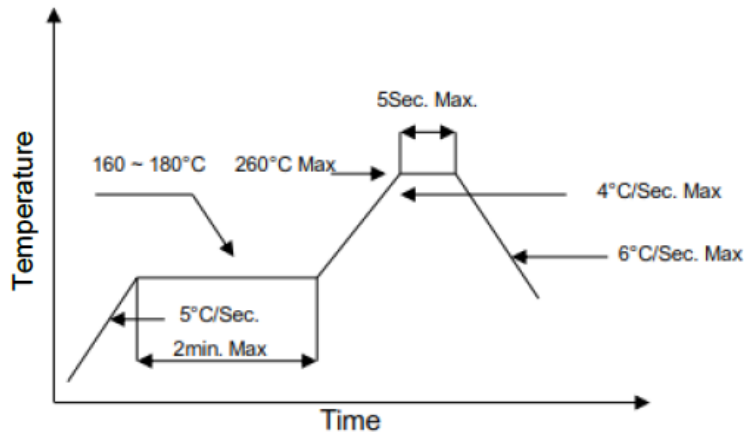
Intensity vs. Wavelength



Outline Dimensions (unit: mm)



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. Please use solder paste to cure the laser diode.
2. Please make sure that the heat of VCSEL diode has been completely conducted to metal shell to avoid affecting the optical power output.
3. This VCSEL diode can be only used in constant voltage and current.
4. Please do not aim the laser at people or animals.
5. You may observe the laser spot through an image monitoring equipment.
6. Please do not touch VCSEL diode surface by naked hands or squeeze the sealant on VCSEL diode surface. It may cause wrong optical angle and distorted laser spot, and even damage the VCSEL diode.
7. Please use ceramic suction nozzle to absorb the VCSEL diode, so as to avoid VCSEL diode sticking to the nozzle.
8. Please add a 0.02s blowing action after locating the laser diode to aluminum substrate.
9. Specifications are subject to change without notice.



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