# 850nm 15mW CW VCSEL Diode

VCx-850C15A

# Description

The Lasermate VCx-850C15A is an 850nm wavelength, 15mW output power, CW operating mode, Vertical Cavity Surface Emitting Laser (VCSEL) diode. Available in different package types, the VCSEL is characterized by its low wavelength drift, oxide isolation technology, high reliability, low threshold current, and small emission area. Designed for proximity sensors, consumer electronics, active optical cables, range finder sensor, and medical applications.

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### **Features**

- 850nm VCSEL Diode •
- Output power: 15mW •
- 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-850C15A	2016 Package, Substrate CuAg
VC20A-850C15A	2016 Package, Substrate AIN
VC35A-850C15A	3535 Package, Substrate AIN
VCT5-850C15A	TO-56 Package, Substrate NiFe
VCT-850C15A	TO-46 Package, Substrate NiFe



Rev 02.0522

#### Specifications

Absolute Maximum Ratings							
Parameters	Symbol	Rating	Unit	Conditions			
Case Operating Temperature	Тор	-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	28	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.

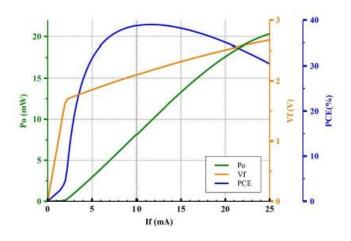
- In its maximum rating diode laser operation could damage its performance or cause potential safety hazard such as equipment failure.
- Electrostatic discharge is the main reason for laser fault of the diode. Take effective precautions against ESD. When dealing with laser diodes, use wrist strap, grounding work surface and strict antistatic technology.

Electro-Optica	l Characteristics (	Top=25°C, C	W mode)				
Parameters		Symbol	Min.	Тур.	Max.	Unit	Conditions
Optical Output Power		Po	-	15	-	mW	I <sub>F</sub> =17mA
Threshold Current		I <sub>th</sub>	-	1.6	-	mA	
Laser Forward Voltage		VF	-	2.4	-	mA	I⊧=17mA
Slope Efficienc	У	η	-	0.98	-	mW/mA	
Power Conversion Efficiency		PCE	-	37	-	%	
Peak Wavelength		λρ	840	850	860	nm	P₀=15mW
Series Resistance		Rs	-	46.8	-	Ω	I⊧=17mA
Beam Angle	(1/e^2)	θ	-	23	-	deg	I⊧=17mA
	FWHM		-	18	-		I <sub>F</sub> =17mA
Wavelength Te	emperature Drift	Δλρ/ΔΤ	-	0.07	-	nm/°C	I⊧=17mA
Emission Area				Ф12		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**

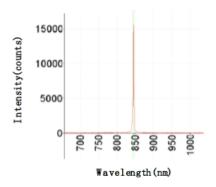
#### LIV Graph



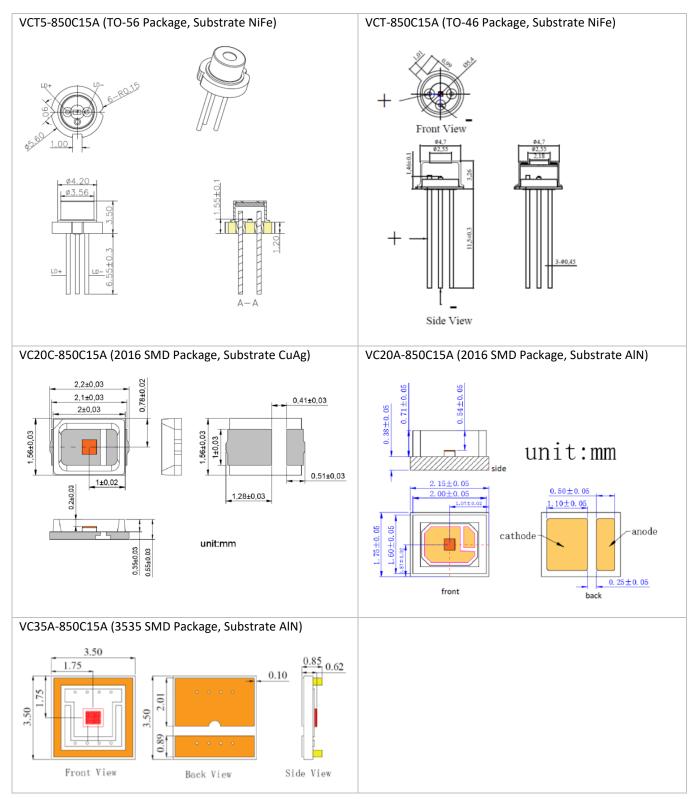
#### Notes:

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

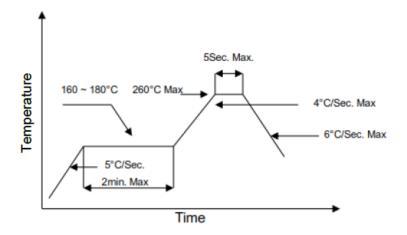
#### Intensity vs. Wavelength



# **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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