



Data Sheet

Rev 01.0123

660nm 2mW Pulsed VCSEL Diode

VCx-660P2A



Description

The Lasermate VCx-660P2A is a 660nm wavelength, 2mW output power, pulsed operating mode, Vertical Cavity Surface Emitting Laser (VCSEL) diode. Available in different package types, the VCSEL features low wavelength drift, narrow linewidth, and easy collimation. Ideal for sensing i.e. proximity, consumer electronics, pulse oximetry, and medical applications.

Features

- 660nm Red VCSEL Diode
- Output power: 2mW
- Low wavelength drift
- Oxide isolation technology
- Narrow linewidth
- Easy to collimate

Applications

- Sensing i.e. Proximity
- Consumer electronics
- Pulse oximetry
- Medical application

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
VC20A-660P2A	2016 Package, Substrate AlN
VC20C-660P2A	2016 Package, Substrate CuAg
VC35A-660P2A	3535 Package, Substrate AlN
VCT5-660P2A	TO56 Package, Substrate NiFe
VCT-660P2A	TO46 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	4	V	
Maximum Pulse Current	I _{max}	12	mA	
ESD Exposure (Human Body) Model	ESD	2K-4K (Class 2)	V	
ESD Exposure (Machine) Model	ESD	200-400 (Class B)	V	

Notes:

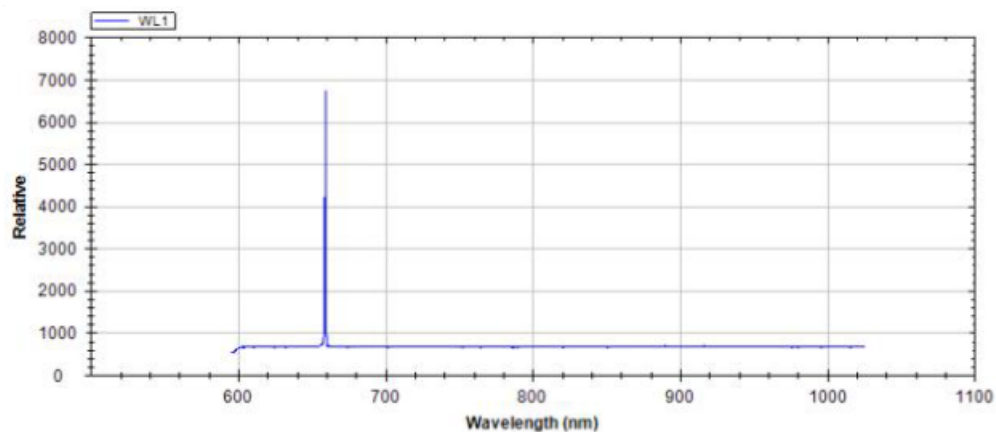
- Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or other conditions above those indicated in the operations section for expanded periods of time may affect reliability.
- 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, 0.1ms pulse width, 1% duty cycle)						
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Optical Output Power	P _o	-	2	-	mW	I _F =10mA
Threshold Current	I _{th}	-	3.2	-	mA	
Forward Current	I _F	-	10	-	mA	
Power Conversion Efficiency	PCE	-	12	-	%	
Slope Efficiency	η	-	0.35	-	mW/mA	
Peak Wavelength	λ _P	655	660	665	nm	P _o =2mW
Forward Voltage	V _f	-	2.5	-	V	I _F =10mA
Emission Diameter		-	φ22		um	
Beam Angle (1/e ²)	Θ	-	20	-	deg	I _F =10mA
Wavelength Temperature Drift	Δλ _P / ΔT	-	0.045	-	nm/°C	I _F =10mA
Soldering Temperature	Tsol			260	°C	10 seconds, AlN, FeNi Alloy
				180	°C	10 seconds, CuAg
Substrate	AlN, CuAg, NiFe					

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

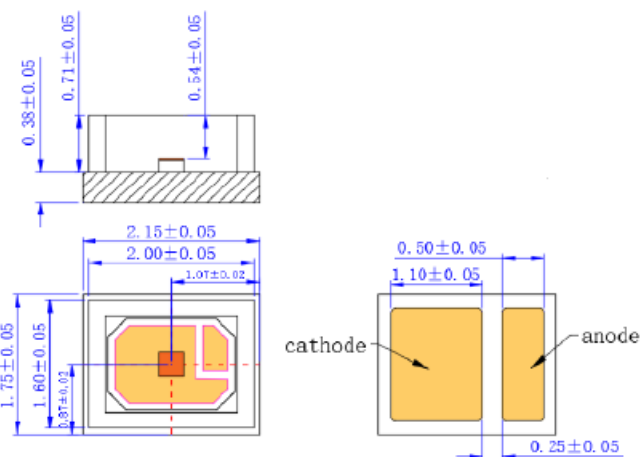
Typical Characteristics

Spectral Wavelength

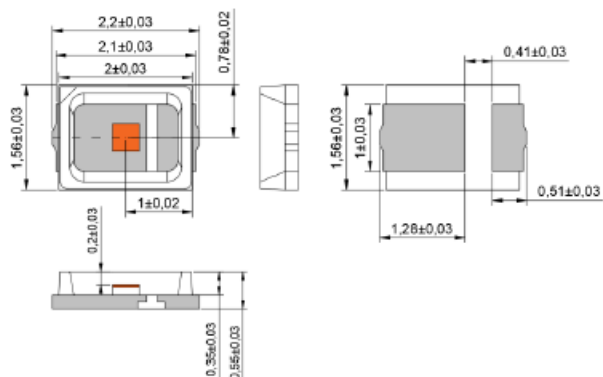


Outline Dimensions (unit: mm)

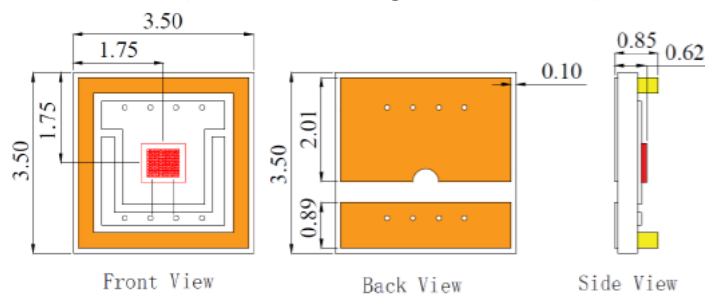
VC20A-660P2A (2016 SMD Package, Substrate AlN)



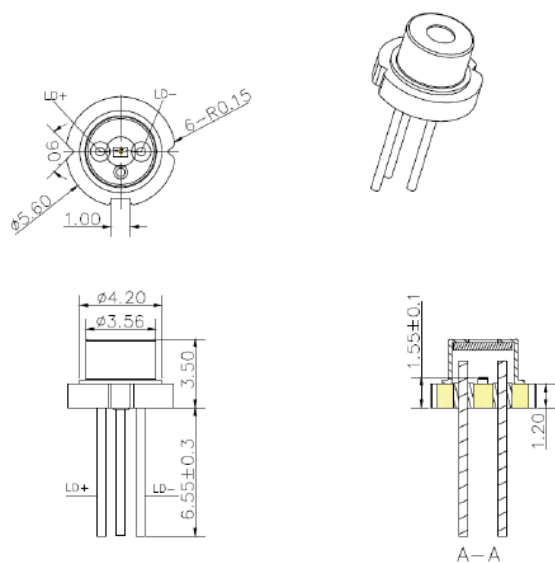
VC20C-660P2A (2016 SMD Package, Substrate CuAg)



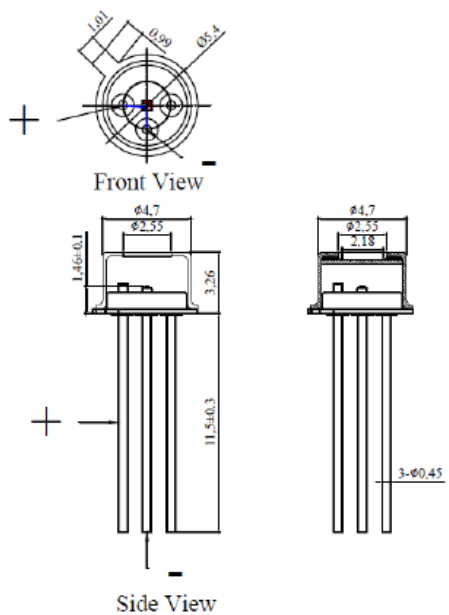
VC35A-660P2A (3535 SMD Package, Substrate AlN)



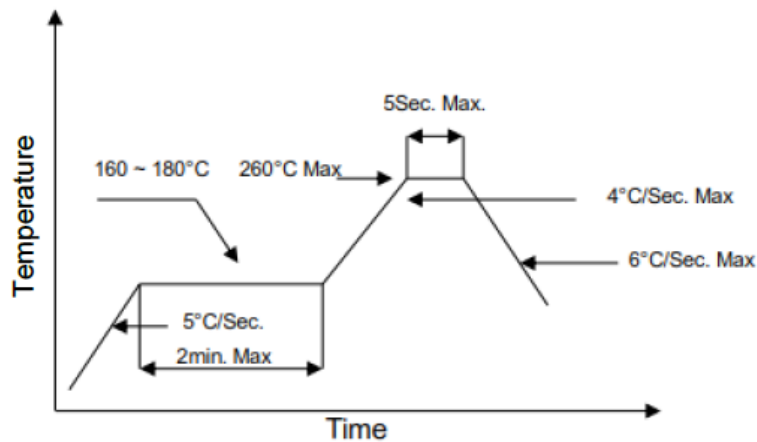
VCT5-660P2A (TO-56 Package, Substrate NiFe)



VCT-660P2A (TO-46 Package, Substrate NiFe)



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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