



VCx-940D100WA

940nm 100W Pulsed Dual Junction VCSEL Diode

Data Sheet

Features

- 940nm Dual Junction VCSEL Diode
- Output Power: 100W (ns pulse)
- High peak power density
- Good thermal conduction
- High reliability in pulsed operation
- Available in SMD or TO-can package options

Applications

- 3D sensing and structured light systems
- Scanning lidar for automotive and robotics
- Laser curtain safety systems
- Range finder sensors
- Time-of-Flight (ToF) 3D detection
- Proximity and gesture sensing

Ordering Information

Part Number	Description
VC20A-940D100WA	940nm 100W Pulsed Dual Junction VCSEL Diode, SMD 2016 Package
VCT5-940D100WA	940nm 100W Pulsed Dual Junction VCSEL Diode, TO-56 Package

* Additional package configurations may be available upon request.

Absolute Maximum Ratings

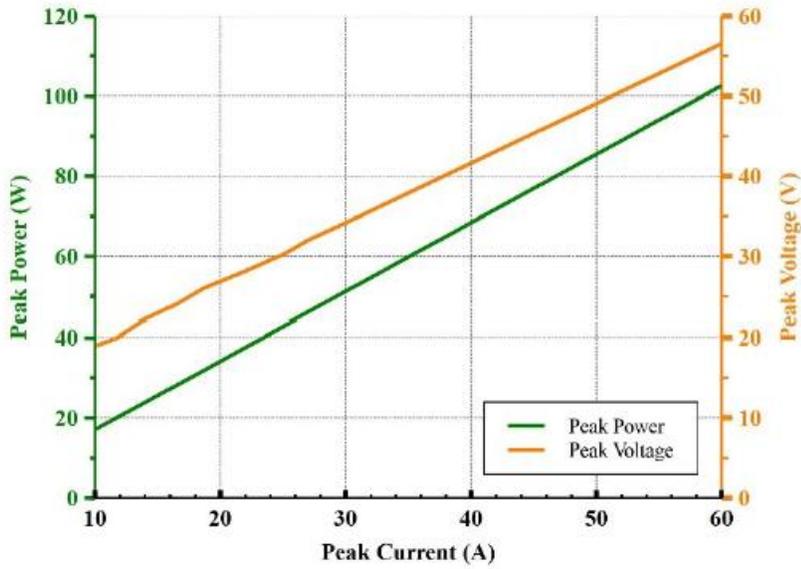
Parameters	Symbol	Rating	Unit	Conditions
Case Operating Temperature	Top	-40 to 85	°C	
Storage Temperature	Tstg	-40 to 125	°C	
Reflow Soldering Temperature	Tsol	260°C	°C	10 seconds
Reverse Voltage	Vr	50	V	
Maximum Continuous Current	I _{max}	60	A	Duty cycle 0.1% max
ESD Exposure (Human Body) Model	ESD	8-10k	V	Class 3
ESD Exposure (Machine) Model	ESD	800-1000	V	Class C

Electro-Optical Characteristics (T_{op}=25°C, Pulse width 6.8ns at 11.68 kHz)

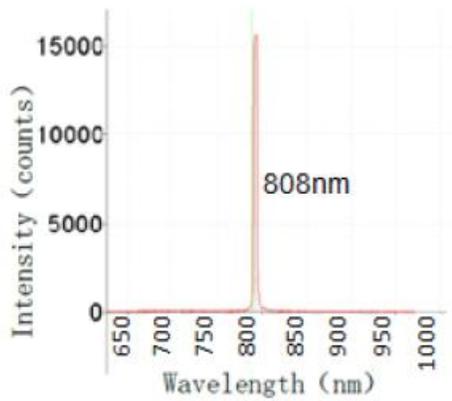
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions	
Optical Output Power	P _o	-	100	-	W	I _F =59A	
Threshold Current	I _{th}	-	0.1	-	A		
Forward Pulse Current	I _F	-	59	-	A		
Slope Efficiency	η	-	1.7	-	W/A		
Emission Area		-	210x199	-	um		
Peak Wavelength	λ _P	930	940	950	nm	P _o =100W	
Pulse Forward Voltage	V _F	-	56	59	V	I _F =59A	
Series Resistance	R _S	-	0.75	-	Ohm	I _F =59A	
Beam Angle	(1/e ²)	θ	-	25	-	I _F =59A	I _F =90A
	FWHM	Θ	-	21	-	I _F =59A	I _F =90A
Wavelength Temperature Drift	Δλ _P / ΔT	-	0.07	-	nm/°C	I _F =59A	
Soldering Temperature	Tsol			260	°C	10 seconds	

Typical Characteristics

LIV Graph

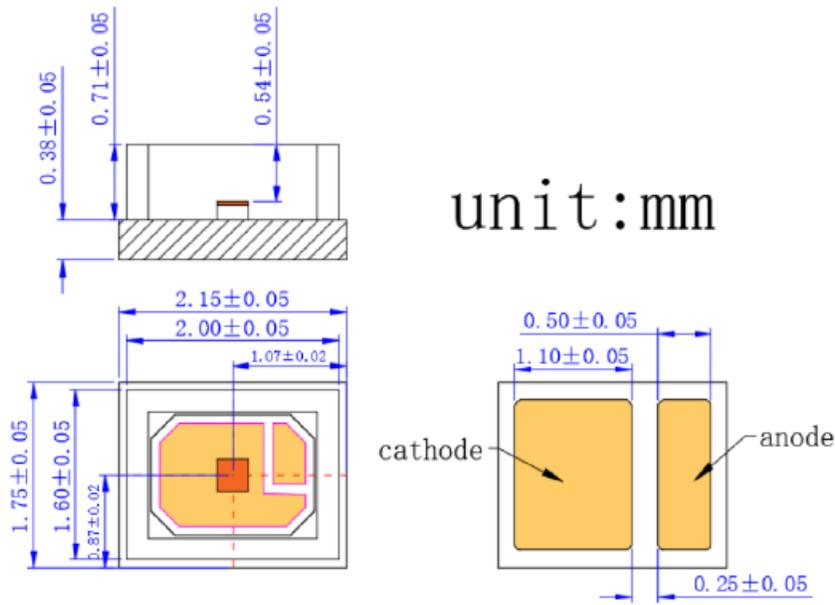


Intensity vs. Wavelength

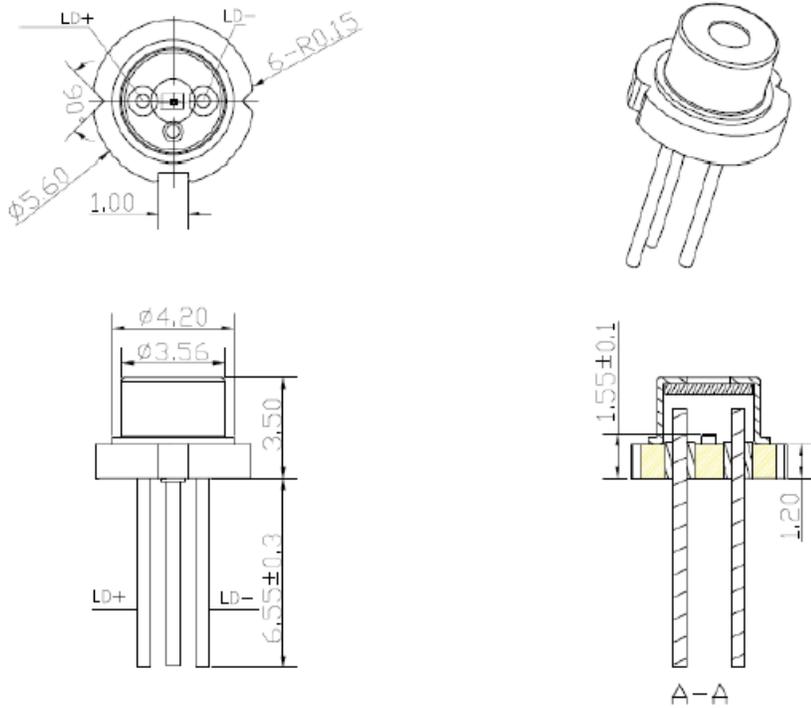


Outline Dimensions (unit: mm)

SMD 2016 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.