ADNV-6340

Single-Mode Vertical-Cavity Surface Emitting Laser (VCSEL)

Data Sheet

Lead (Pb) Free
RoHS 6 fully compliant

Description

This advanced class of VCSELs was engineered by Avago Technologies providing a laser diode with a single longitudinal as well as a single transverse mode. In contrast to most oxide-based single-mode VCSELs, these VCSELs remain within a single mode operation over a wide range of output power. When compared to an LED, the ADNV-6340 has a significantly lower power consumption making it an ideal choice for optical navigation applications.

Features

- Advanced Technology VCSEL chip
- Single Mode Lasing operation
- Non-hermetic plastic package
- 832-865 nm wavelength
- Enhanced ESD up to 2-KV

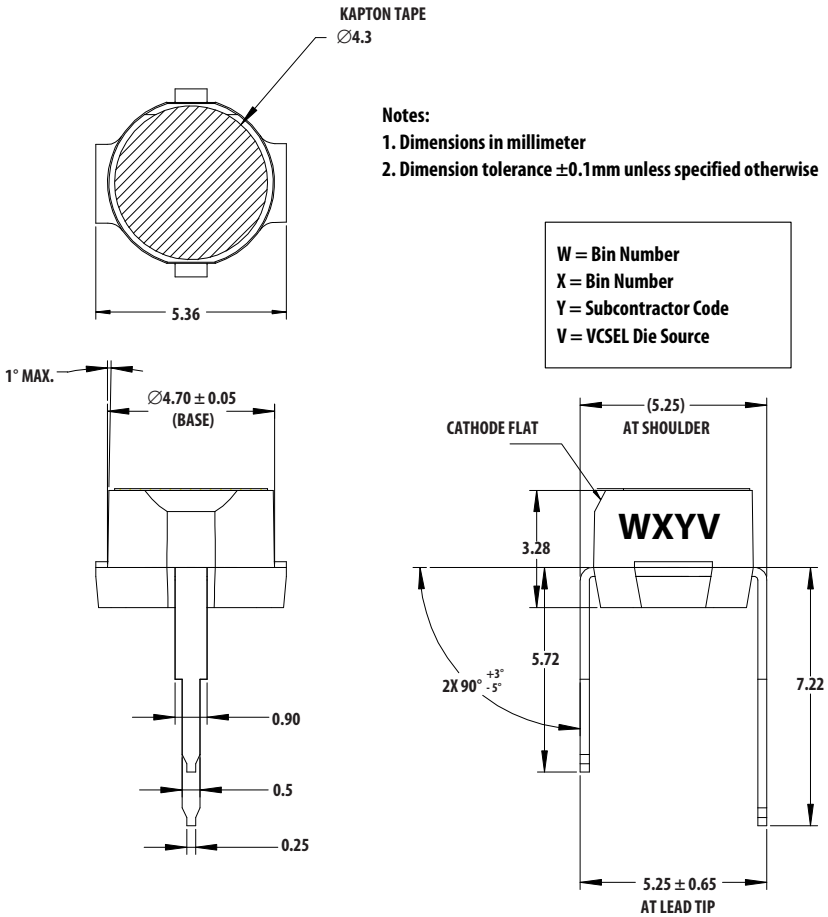


Figure 1. Outline drawing for ADNV-6340 VCSEL

Note: Since the VCSEL package is not sealed, the protective kapton tape should not be removed until just prior to assembly into the ADNS-6120 or ADNS-6130-001 lens.

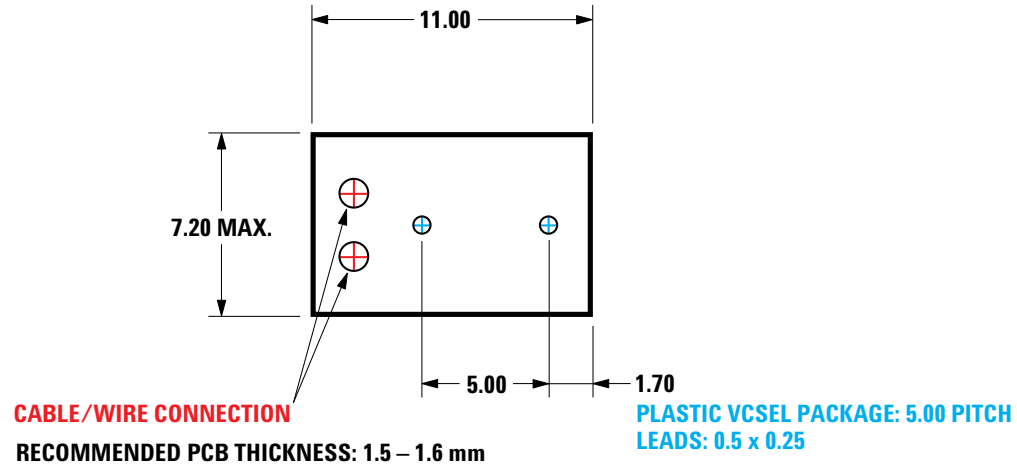


Figure 2. Suggested ADNV-6340 PCB mounting guide

Absolute Maximum Ratings

VCSEL Die Source Marking	V = A,V	V = C		
Parameter	**Max**	**Max**	**Units**	**Notes**
DC Forward current	12	7.0	mA	
Peak Pulsing current	19	9	mA	Duration = 100ms, 10% duty cycle
Power Dissipation	24	24	mW	
Reverse voltage	5	8	V	I = 10µA
Laser Junction Temperature	150	170	°C	
Operating case Temperature	5 to 45	5 to 45	°C	
Storage case Temperature	-40 to +85	-40 to +85	°C	
Lead Soldering Temperature	260	260	°C	See reflow profile (Figure 6)
ESD (Human-body model)	2	2	kV	

Comments:

1. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are the stress ratings only and functional operation of the device at these or any other condition beyond those indicated for extended period of time may affect device reliability.
2. The maximum ratings do not reflect eye-safe operation. Eye safe operating conditions are listed in the power adjustment procedure section in the LaserStream sensor datasheet.
3. The inherent design of this component causes it to be sensitive to electrostatic discharge. The ESD threshold is listed above. To prevent ESD-induced damage, take adequate ESD precautions when handling this product.

Optical/Electrical Characteristics (at Tc = 5°C to 45°C):

VCSEL Die Source Marking		V = A,V			V = C				
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Units**	**Notes**
Peak Wavelength	λ	832		865	832		865	nm	
Maximum Radiant Power	LOPmax		4.5			4.0		mW	Maximum output power under any condition. This is not a recommended operating condition and does not meet eye safety requirements.
Wavelength Temperature coefficient	dλ/dT		0.065			0.065		nm/°C	
Wavelength Current coefficient	dλ/dI		0.21			0.3		nm/mA	
Beam Divergence	θFW@1/e^2		15			16		deg	
Threshold current	Ith		4.2			3.0		mA	
Slope Efficiency	SE		0.4			0.35		W/A	
Forward Voltage	VF		2.1	2.4		2.1	2.4	V	At 500uW output power

Comments:

VCSELs are sorted into bins. Appropriate binning resistor should be used in the application circuit and/or match with the register value of laser current range to achieve the target output power. Refer to LaserStream sensor datasheets.

Typical Characteristics

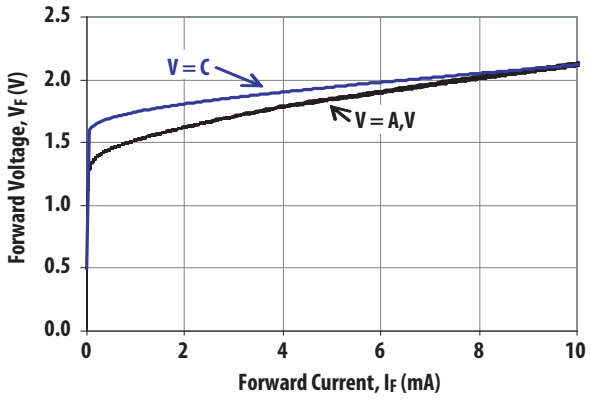


Figure 3. Forward voltage vs. forward current

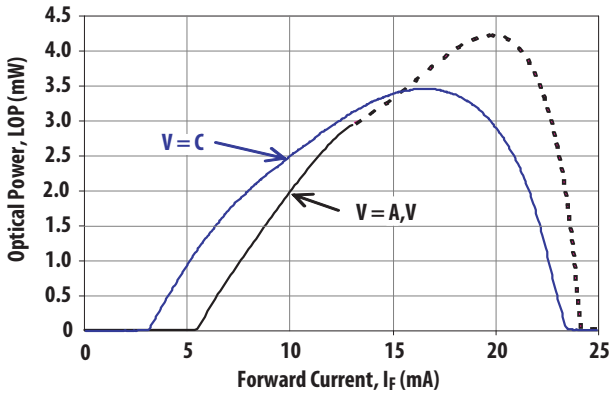


Figure 4. Optical power vs. forward current

Danger: *When driven with current or temperature range greater than specified in the power adjustment procedure section, eye safety limits may be exceeded. At this level, the VCSEL should be treated as a Class IIIb laser, potentially an eye safety hazard.*

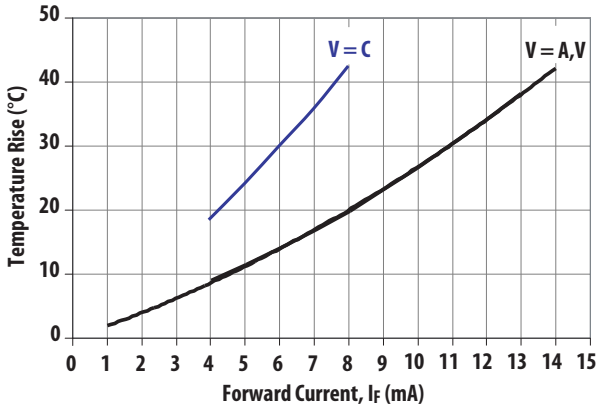


Figure 5. Junction temperature rise vs. forward current

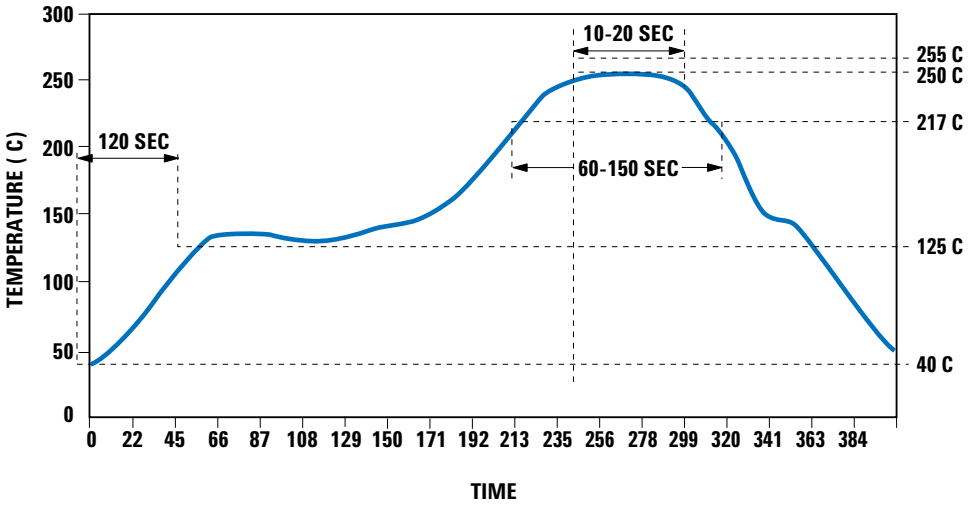


Figure 6. Recommended reflow soldering profile

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