

FEATURES:

- Designed for low drive currents between 1 and 4 mA
- Ultra Flat Window TO-46 style package
- Advanced Technology VCSEL Chip
- 850 nm wavelength
- Single Mode Lasing Operation

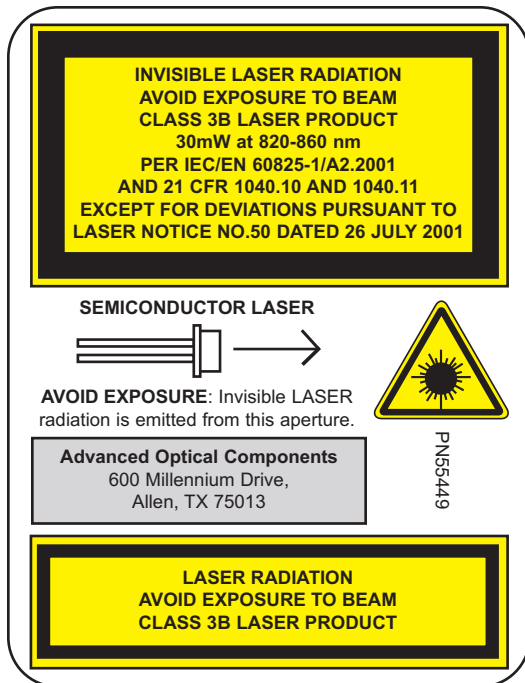
This is a new and advanced class of VCSELs from Advanced Optical Components having dramatically reduced electrical power consumption, reduced variation with temperature and excellent reliability. Advanced Optical Components Single Mode VCSELS have been engineered to achieve a good balance between threshold current and reliability. The 850nm single mode VCSELs are available in all of the current Advanced Optical Components VCSEL packaging configurations such as the TO46, and surface mount components. Custom packaging designs are also available..

The SV3639 combines many of the desired features of an LED and the advantages of a laser diode operating in a single longitudinal mode and a single transverse mode. The VCSEL provides increased power output at low drive currents. As the current increases above its threshold, the light intensity increases proportionally.



Part Number	Description
SV3639-001	High Speed Advanced Technology VCSEL Component

ABSOLUTE MAXIMUM RATINGS



Parameter	Rating
Storage temperature	-40°C to +85°C
Operating temperature	0°C to +50°C
Lead solder temperature	260°C, 10 seconds
Power Supply Voltage	2.5 V
Continuous forward current	4mA

NOTICE: 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 any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

NOTICE: The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product

ELECTRO-OPTICAL CHARACTERISTICS

Parameter	Symbol	Units	Min	Typ	Max	Notes
Forward Voltage	V_F	V		1.9	2.5	$T_A=25^\circ\text{C}, I_F=4\text{mA}$
Series Resistance	R_S	Ω	75	110	175	$3\text{-}4\text{mA}, T_A=25^\circ\text{C}$
Series Resistance Temperature Coefficient	dR_S/dT	$\%/^\circ\text{C}$		-0.25		$I_F=4\text{mA}, 0\text{-}70^\circ\text{C}$
VCSEL reverse voltage	V_R	V		-10		$I_R=10\mu\text{A}$
Threshold Current	I_{TH}	mA			1.5	$T_A=25^\circ\text{C}, 1$
Slope Efficiency	η	mW/mA	0.25	0.35	0.6	$T_A=25^\circ\text{C}$
Slope Efficiency Temperature Coefficient	$d\eta/dT$	$\%/^\circ\text{C}$		-0.6		$3\text{-}4\text{mA}, T_A=0\text{-}70^\circ\text{C}$
Power	P	mW	0.7			$I_F=4\text{mA}$
Beam Divergence	Θ_{FWHM}	deg		11	16	$T_A=25^\circ\text{C}, I_F=4\text{mA}$
Rise/Fall Time	$T_{R,F}$	ps		150		
Peak Wavelength	λ	nm	835		865	$T=25^\circ\text{C}, I_F=4\text{mA}$
Side mode suppression Ratio	SMSR	dB	15	30		$T_A=25^\circ\text{C}, I_F=4\text{mA}$
Wavelength temperature coefficient	$d\lambda/dT$	$\text{nm}/^\circ\text{C}$		0.06		$0\text{-}70^\circ\text{C}$
Change in wavelength with current	$d\lambda/dI$	nm/mA		0.25		$T_A=25^\circ\text{C}$

ELECTRO-OPTICAL CHARACTERISTICS ($V_{CC}=5\text{V}, T=25^\circ\text{C}$ unless otherwise specified)

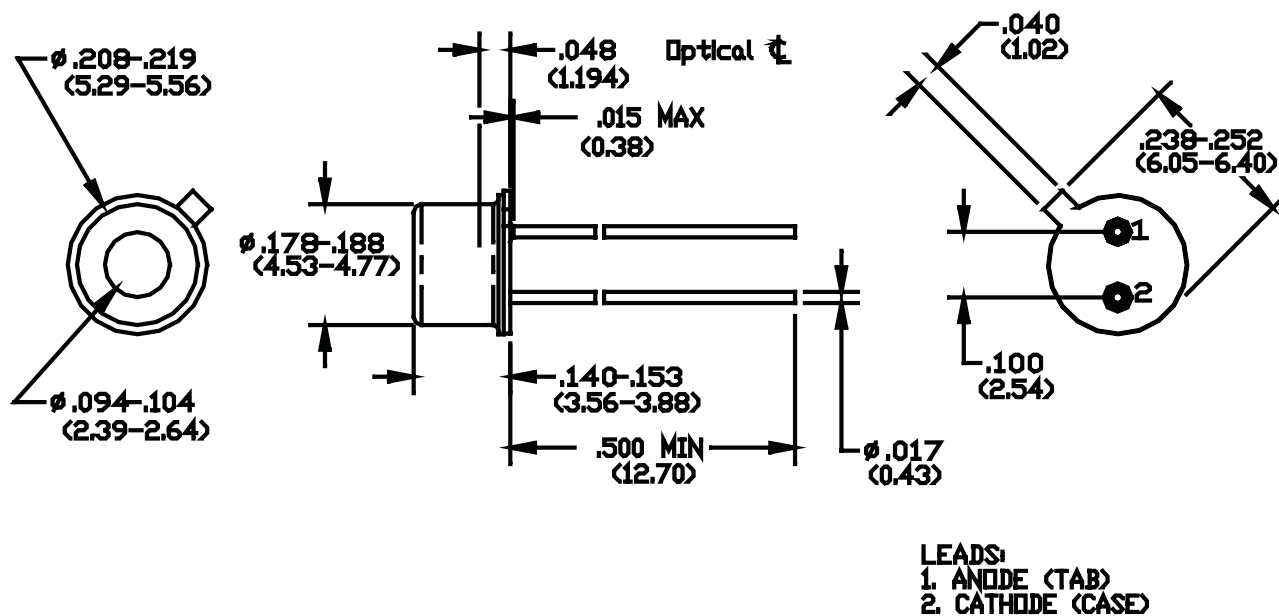
NOTES

1. Minimum threshold occurs above room temperature. This helps in reducing power variation over temperature at a constant current

These single-mode parts have very small active volumes, leading to several notable properties.

- They are even more sensitive to ESD than are multi-mode VCSELs or CD lasers.
- They operate at currents typically below 5 mA and should never be driven at much higher currents.
- The spectral peak shifts significantly with current, but shifts only slowly with ambient temperature. Operation at a particular wavelength can be achieved by first setting the current at an appropriate level, then adjusting the temperature.
- While they are designed to stay single mode over the whole operating current range, at very high currents they may become multi-mode, increasing the spectral width and the beam divergence.
- Despite their low operating currents, these VCSELs can emit sufficient power to be categorized as Class 1M lasers, and should be treated with the usual precautions.

MOUNTING DIMENSIONS



MOUNTING DIMENSIONS (for reference only): All dimensions are in inches. [mm]

ADVANCED OPTICAL COMPONENTS

Finisar's ADVANCED OPTICAL COMPONENTS division was formed through strategic acquisition of key optical component suppliers. The company has led the industry in high volume Vertical Cavity Surface Emitting Laser (VCSEL) and associated detector technology since 1996. VCSELS have become the primary laser source for optical data communication, and are rapidly expanding into a wide variety of sensor applications. VCSELS' superior reliability, low drive current, high coupled power, narrow and circularly symmetric beam and versatile packaging options (including arrays) are enabling solutions not possible with other optical technologies. ADVANCED OPTICAL COMPONENTS is also a key supplier of Fabrey-Perot (FP) and Distributed Feedback (DFB) Lasers, and Optical Isolators (OI) for use in single mode fiber data and telecommunications networks

LOCATION

- Allen, TX - Business unit headquarters, VCSEL wafer growth, wafer fabrication and TO package assembly.
- Fremont, CA – Wafer growth and fabrication of 1310 to 1550nm FP and DFB lasers.
- Shanghai, PRC – Optical passives assembly, including optical isolators and splitters.

SALES AND SERVICE

Finisar's ADVANCED OPTICAL COMPONENTS division serves its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact a nearby sales office or call the number listed below.

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AOC CAPABILITIES

ADVANCED OPTICAL COMPONENTS' advanced capabilities include:

- 1, 2, 4, 8, and 10Gbps serial VCSEL solutions
- 1, 2, 4, 8, and 10Gbps serial SW DETECTOR solutions
- VCSEL and detector arrays
- 1, 2, 4, 8, and 10Gbps FP and DFB solutions at 1310 and 1550nm
- 1, 2, 4, 8, and 10Gbps serial LW DETECTOR solutions
- Optical Isolators from 1260 to 1600nm range
- Laser packaging in TO46, TO56, and Optical subassemblies with SC, LC, and MU interfaces for communication networks
- VCSELS operating at 670nm, 780nm, 980nm, and 1310nm in development
- Sensor packages include surface mount, various plastics, chip on board, chip scale packages, etc.
- Custom packaging options