

---

## Preliminary Product Specification

---

### High Powered 860nm VCSELs

---

#### HVS7000-001

#### PRODUCT FEATURES

- 10's of Watts of Peak Power
- Intended for pulsed applications
- Pulse widths of <10ns
- Duty Cycle <1%
- Gaussian Beam profile
- Narrow Beam Divergence
- Stable wavelength over Temperature
- High Efficiency



#### APPLICATIONS

- Gesture Recognition
- 3D IR Imaging

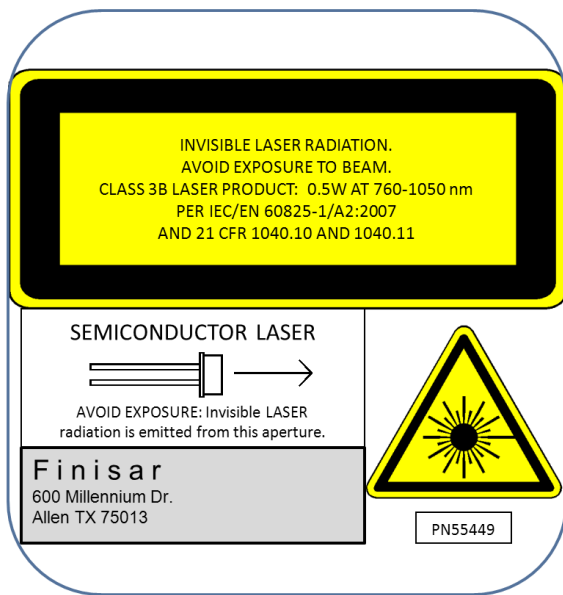
Finisar has developed a 2D VCSEL array TO based component that is specifically targeted towards use in gesture recognition and 3D camera applications. This specific product is packaged in a TO-46 can with a 2D VCSEL that is capable of delivering more than 500mW of CW power at room temperature. The intended use is with short electrical pulses (<10ns) and low duty cycle (<1%) where peak powers can reach 10W. In pulsed operation, the 2D array emits a Gaussian shaped optical beam and is capable of rise and fall times less than 1ns. Refer to Finisar application note AN-2109 entitled “High Power VCSELs for Gesture Recognition” for more information.

#### PRODUCT SELECTION

Part Number	Description
HVS7000-001	High power 860nm VCSEL in TO-46 Can

## I. Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to +85°C
Case Operating Temperature	-10 to +60°C
Lead Solder Temperature	260°C, 10 sec.
Reverse Voltage	5V
Max continuous forward current	1.75A
Max peak forward current (<100ns, DC<1%)	20A
ESD Exposure (Human Body Model)	500V



### 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

### 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.

### III. Electro-Optical Characteristics ( $T_{OP} = 25\text{ }^{\circ}\text{C}$ )

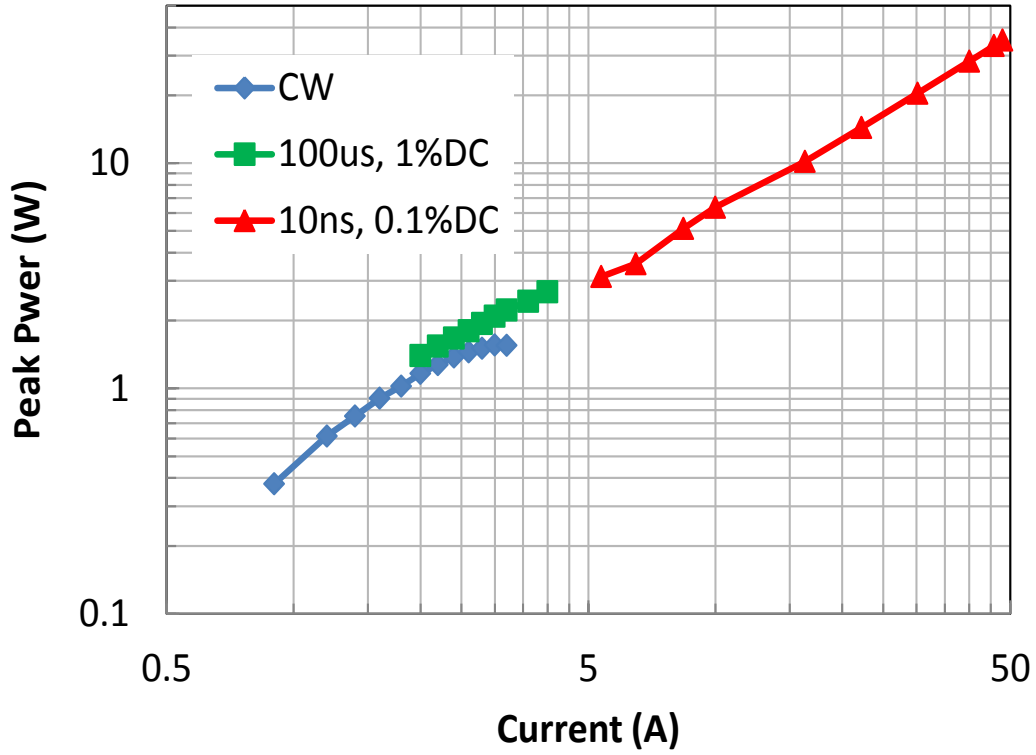
VCSEL Parameters	Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
CW Optical Power	$I_F = 1.5\text{A}$	$P_{O,CW}$	500			mW	1
Peak Optical Power	$I_{PULSE} = 10\text{A}, T_{PULSE} = 10\text{ns}, \text{DC} = 0.1\%$	$P_{O,PULSED}$	7			W	2
Threshold Current		$I_{TH}$		500		mA	
Slope Efficiency	$I_F = 1-1.5\text{A}; T_A = 25^{\circ}\text{C}$	$\eta$	0.8			mW/mA	3
Slope Efficiency Temperature variation	$T_A = 0^{\circ}\text{C to } 70^{\circ}\text{C}$	$\Delta\eta/\Delta T$		-3000		ppm/ $^{\circ}\text{C}$	4
Peak Wavelength	$I_F = 1.5\text{A},$	$\lambda_P$	840	860	870	nm	
$\lambda_P$ Temperature Variation	$I_F = 1.5\text{A},$	$\Delta\lambda_P/\Delta T$		0.06		nm/ $^{\circ}\text{C}$	
Spectral Bandwidth, RMS	$I_F = 1.5\text{A}$	$\Delta\lambda$		0.25	1	nm	
Laser Forward Voltage	$I_F = 1.5\text{A}$				3.0	V	
Rise and Fall Times	$I_F = 1.5\text{A}$	$t_r, t_f$		1		ns	5
Series Resistance	$I_F = 1-1.5\text{A}; T_A = 25^{\circ}\text{C}$	$R_S$			1	$\Omega$	
Beam Divergence	$I_{PULSE} = 10\text{A}, T_{PULSE} = 10\text{ns}, \text{DC} = 0.1\%$	$\theta$	10	16	25	Degrees	6

#### Notes:

- For the purpose of these tests,  $I_F$  is DC current. The TO can must be attached to a proper heat sink and held at 25C.
- $I_{PULSE}$  is defined as the peak current with a pulse width of  $T_{PULSE}$  and a duty cycle (DC) defined as the ratio of pulse width to pulse repetition time. For a 10ns pulse, the pulse interval is 10us for a 0.1% DC.
- Slope efficiency is defined as  $\Delta P_O/\Delta I_F$ .
- To compute the value of Slope Efficiency at a temperature T, use the following equation:  

$$\eta(T) \approx \eta(25^{\circ}\text{C}) * [1 + (\Delta\eta/\Delta T) * (T - 25)]$$
- Rise and fall times specifications are the 20% - 80%. Rise and fall times are sensitive to drive electronics and a small prebias current (~10mA) may be needed for optimal performance.
- Beam divergence is defined as the total included angle between the  $1/e^2$  intensity points

**IV. Typical Performance Curves**



## VI. Environmental Specifications

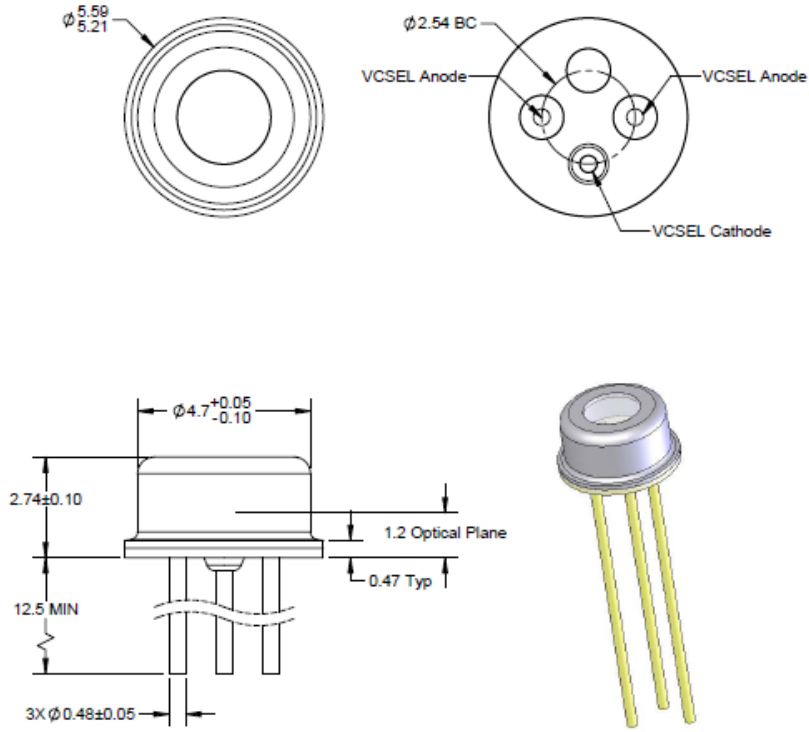
Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	T <sub>op</sub>	-10		60	°C	
Storage Temperature	T <sub>sto</sub>	-40		85	°C	

## VII. Regulatory Compliance

Feature	Agency	Standard	Certificate Number
Laser Eye Safety	FDA/CDRH	CDRH 21 CFR 1040 and Laser Notice 50	9521487

Copies of the referenced certificates are available at Finisar Corporation upon request.

## IX. Mechanical Specifications



**XII. Revision History**

<b>Revision</b>	<b>Date</b>	<b>Description</b>
A1	12/10/2012	<ul style="list-style-type: none"><li>• Preliminary Document created.</li></ul>
B00	10/30/2014	<ul style="list-style-type: none"><li>• Modified performance specs with recent data</li></ul>
B01	1/14/2016	<ul style="list-style-type: none"><li>• Removed spacer under the VCSEL</li></ul>

**XII. For More Information**

Finisar Corporation  
1389 Moffett Park Drive  
Sunnyvale, CA 94089-1133  
Tel. 1-408-548-1000  
Fax 1-408-541-6138  
[sales@finisar.com](mailto:sales@finisar.com)  
[www.finisar.com](http://www.finisar.com)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.