

## Specification Sheet

VS-CW-092011



### Active Cooled Laser Diode Vertically Stacked

**Up to 120W CW**  
**Center Wavelength: 808-980nm**

#### Introduction

Apollo Instruments' high-powered laser diode bars deliver up to 120W in CW. They are available in the following wavelengths:

808 nm  
915 nm / 940 nm / 976 nm / 980nm

These laser diode bars are micro-channel water-cooled. They have been demonstrated to be of high quality with long lifetime.

#### Key Features

- High power
- Long lifetime
- Uniform beam profile
- Wavelength 808-980nm
- CW operation
- Fast delivery time

#### Applications

- DPSSL & Fiber Laser Pumping
- Medicine
- Selective Soldering/Desoldering
- Heat Treatment
- Welding/Blazing
- Quick Cure of Epoxy
- Transformation Hardening
- And more

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**Specifications**

	Units	VSxx-Y -60-808 <sup>1</sup>	VSxx-Y -60-808 <sup>1</sup>	VSxx-Y -60-808 <sup>1</sup>	VSxx-Y -80-808 <sup>1</sup>	VSxx-Y -100-808 <sup>1</sup>	VSxx-Y -100-808 <sup>1</sup>
<b>Optical Specifications</b> <sup>3,8</sup>							
Center wavelength, $\lambda$	nm	808 $\pm$ 3	808 $\pm$ 3	808 $\pm$ 3	808 $\pm$ 3	808 $\pm$ 3	808 $\pm$ 3
Output power per bar <sup>2</sup>	W	60	60	60	80	100	100
Number of bars	-	2 to 25					
Bar-to-Bar Spacing	mm	1.8					
Fill factor	%	20	30	50	50	50	50
Number of emitters	-	19	19	47	47	25	47
Emitter width	$\mu$ m	100	150	100	100	200	100
Spectral width FWHM	nm	$\leq$ 3					
Spectral width FW90%E	nm	$\leq$ 6					
Fast axis divergence (FWHM) <sup>4,7</sup>	°	35					
Slow axis divergence (FWHM) <sup>5</sup>	°	8					
Polarization mode	-	TE	TE/TM	TE	TE	TE	TE
Wavelength temp. coefficient	nm/°C	$\sim$ 0.28					
<b>Electrical Parameters</b> <sup>3,8</sup>							
Operating current, $I_{op}$	A	$\leq$ 65	$\leq$ 70	$\leq$ 70	$\leq$ 88	$\leq$ 110	$\leq$ 110
Threshold current, $I_{th}$	A	$\leq$ 10	$\leq$ 11	$\leq$ 18	$\leq$ 22	$\leq$ 25	$\leq$ 21
Operating voltage, $V_{op}$	V	$\leq$ 2					
Slope efficiency	W/A	$\geq$ 1.1					
Power conversion efficiency	%	$\geq$ 50	$\geq$ 50	$\geq$ 48	$\geq$ 50	$\geq$ 50	$\geq$ 50
<b>Thermal Parameters</b>							
Operating temperature	°C	15 to 35					
Storage temperature <sup>6</sup>	°C	-40 to 60					
Coolant	-	Deionized water					
Flow rate per bar	L/min	0.25 to 0.30					
Max inlet pressure	kPa	380					
Conductivity	M $\Omega$ -cm	0.2 to 0.5					

1. Model Name Breakdown - VSxx-Y-60-808: xx = Structure Code (01, 02, 03, 05), Y = Number of bars, 60 = Output power (W), 808 = Center wavelength (nm).
2. Reduced lifetime if used above nominal operating conditions.
3. Data at 25°C temperature, unless otherwise stated.
4. For fast axis collimation: divergence  $<0.5^\circ$ .
5. Slow axis collimation is available for bars with fill factor  $\leq 30\%$ .
6. A non-condensing environment is required for storage and operation below ambient dew point.
7. For smile requirements, please contact us.
8. If there are any other requirements, please contact us.

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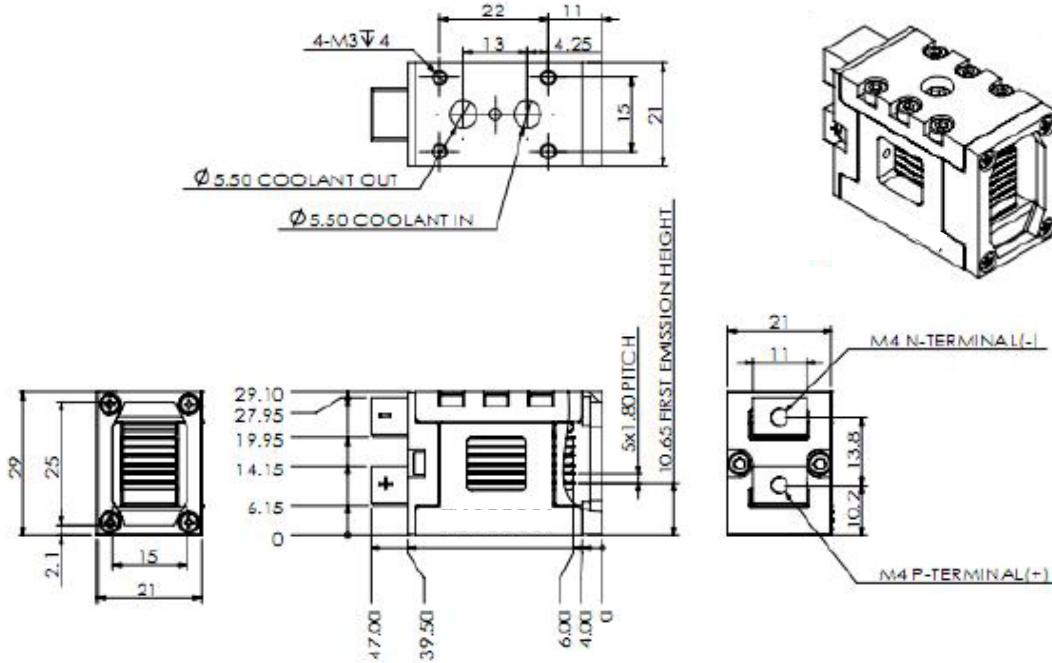
	Units	VSxx-Y -80-915 <sup>1</sup>	VSxx-Y -80-940 <sup>1</sup>	VSxx-Y -120-940 <sup>1</sup>	VSxx-Y -80-976 <sup>1</sup>	VSxx-Y -80-976 <sup>1</sup>	VSxx-Y -120-980 <sup>1</sup>
<b>Optical Specifications</b> <sup>3,8</sup>							
Center wavelength, $\lambda$	nm	915 $\pm$ 3	940 $\pm$ 3	940 $\pm$ 10	976 $\pm$ 3	976 $\pm$ 3	980 $\pm$ 10
Output power per bar <sup>2</sup>	W	80	80	120	80	80	120
Number of bars	-	2 to 25					
Bar-to-Bar Spacing	mm	1.8					
Fill factor	%	20	20	50	20	30	50
Number of emitters	-	19	19	25	19	19	25
Emitter width	$\mu$ m	100	100	200	100	150	200
Spectral width FWHM	nm	$\leq$ 4					
Spectral width FW90%E	nm	$\leq$ 7	$\leq$ 7	$\leq$ 6	$\leq$ 7	$\leq$ 7	$\leq$ 6
Fast axis divergence (FWHM) <sup>4,7</sup>	°	35					
Slow axis divergence (FWHM) <sup>5</sup>	°	8					
Polarization mode	-	TE					
Wavelength temp. coefficient	nm/°C	$\sim$ 0.31	$\sim$ 0.32	$\sim$ 0.32	$\sim$ 0.34	$\sim$ 0.34	$\sim$ 0.32
<b>Electrical Parameters</b> <sup>3,8</sup>							
Operating current, $I_{op}$	A	$\leq$ 80	$\leq$ 82	$\leq$ 120	$\leq$ 80	$\leq$ 84	$\leq$ 120
Threshold current, $I_{th}$	A	$\leq$ 8	$\leq$ 7.5	$\leq$ 20	$\leq$ 7	$\leq$ 9	$\leq$ 20
Operating voltage, $V_{op}$	V	$\leq$ 2	$\leq$ 2	$\leq$ 1.8	$\leq$ 2	$\leq$ 2	$\leq$ 1.8
Slope efficiency	W/A	$\geq$ 1.1	$\geq$ 1.1	$\geq$ 1.1	$\geq$ 1.0	$\geq$ 1.05	$\geq$ 1.1
Power conversion efficiency	%	$\geq$ 55	$\geq$ 55	$\geq$ 52	$\geq$ 55	$\geq$ 55	$\geq$ 52
<b>Thermal Parameters</b>							
Operating temperature	°C	15 to 35					
Storage temperature <sup>6</sup>	°C	-40 to 60					
Coolant	-	Deionized water					
Flow rate per bar	L/min	0.25 to 0.30					
Max inlet pressure	kPa	380					
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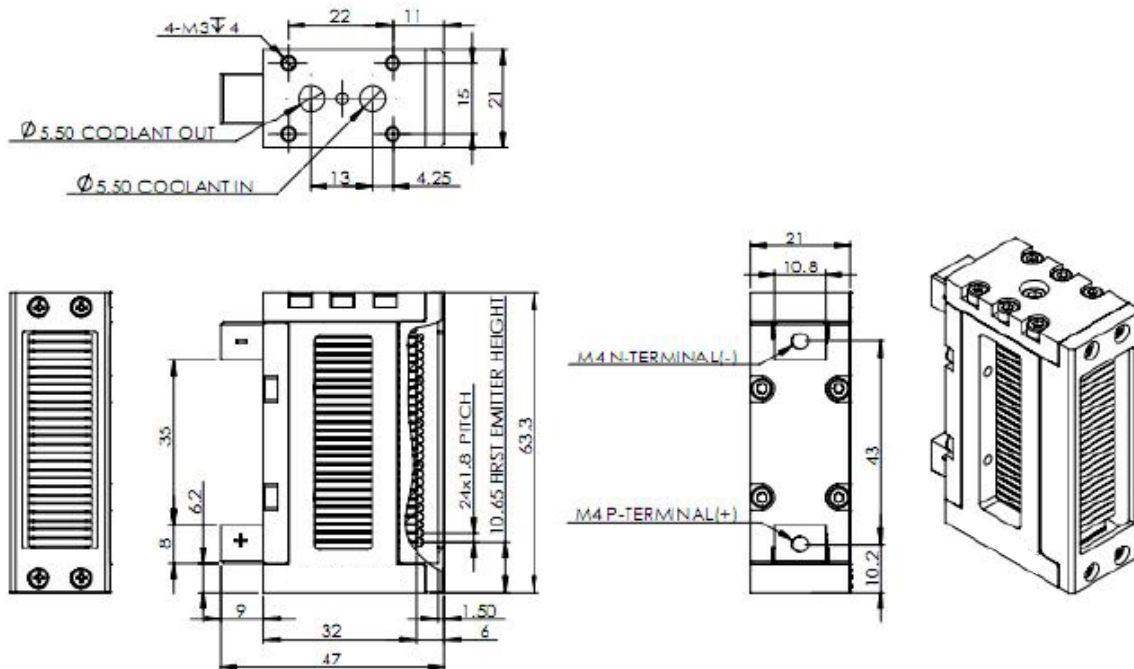
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### Dimensions Diagram (measurements in mm unless specified)

- VS01



- VS02



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## Ordering Information

To make an order or request for further information on this or other products, please contact our sales representative by phone (949) 756-3111 or email [contact@apolloinstruments.com](mailto:contact@apolloinstruments.com).

## Laser Safety

High Power Diode Lasers emit radiation in the visible and infrared region of the spectrum. When in use, safety precautions should be taken to avoid possibility of eye damage. For Class IV lasers, extreme care must be exercised during their operation. Do not allow exposure of the eye or skin to direct or scattered radiation. If viewing is required, the beam should be observed by reflection from matte surface utilizing an image converter or a suitable fluorescent screen. Serious injury may result if any part of the body is exposed to the beam. The eye is extremely sensitive to the infrared radiation and therefore, proper eyewear must be worn at all times.

The laser products made by Apollo Instruments emit visible and invisible radiation power. The devices are intended for use by qualified personnel who recognize shock hazards or laser hazards and are familiar with safety precautions required to avoid possible injury.

ESD - Like most semiconductor devices, laser diodes can be easily damaged or destroyed by inadvertent electrical or static discharges. Laser Diodes are very sensitive to electrostatic discharge (ESD) and may suffer latent catastrophic damage unless they are handled according to proper ESD procedures. The resulting decreased performance of the laser may appear immediately, or long after the damage occurs. A static free environment is mandatory. Grounded tweezers and a grounded wrist strap on the user, a grounded work surface, anti-static floors and case ground for the laser diode all reduce risk of damaging static discharge through the diode. Retain the laser diode in a static free environment when not in use (such as the shipping container). Short the diodes at all times when not in use. (Note: An unshorted laser can be damaged by ESD even without touching it!) The user should never try to service and repair the device without authorization of Apollo Instruments. Apollo Instruments is not responsible to any damages resulted by unauthorized repair and services. Any attempt to opening the laser unit will void the limited warranty to the device.