Specification Sheet

CS-CW-092011

Passive Cooled Laser Diode Bars

Up to 80W CW
Center Wavelength: 792-1550nm

Introduction

Apollo Instruments' high-powered laser diode bars deliver up to 80W in CW. They are available in the following wavelengths:

792 nm
808 nm / 825 nm / 880 nm
915 nm / 940 nm / 976 nm
1470 nm / 1550 nm

The laser diode bars are built for maintenance free operation. Micro-channeled laser diodes are not used, which eliminate the need for de-ionized water, ultra-fine filter, and high-pressure pump. Thus it is suitable for robust industrial applications.

These diode bars have been demonstrated to be of high quality with long lifetime.

Key Features

- High power
- Long lifetime
- Low smile
- Narrow spectrum
- Wavelength 792-1550nm
- 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

Specifications

	Units	CS01/CS04-50-792	CS01/CS04-40-808	CS01/CS04-40-808	CS01/CS04-60-808
Optical Specifications [3,8]					
Center wavelength, λ	nm	792 ±3	808 ±5	808 ±3	808 ±3
Output power[2]	W	50	40	40	60
Fill factor	%	30	30	20	30
Number of emitters	-	19			
Emitter width	μm	150	150	100	150
Spectral width FWHM	nm	≤3	≤4	≤3	≤3
Spectral width FW90%E	nm	≤6	≤6	≤7	≤5
Fast axis divergence (FWHM) [4,7]	°	35			
Slow axis divergence (FWHM) [5]	°	8			
Polarization mode	-	TE	TE/TM	TE	TE/TM
Wavelength temp. coefficient	nm/°C	~0.27	~0.28	~0.28	~0.28
Electrical Parameters [3,8]					
Operating current, I_{op}	A	≤60	≤48	≤46	≤70
Threshold current, I_{th}	A	≤13	≤10	≤10	≤15
Operating voltage, V_{op}	V	≤2			
Slope efficiency	W/A	≥1	≥1.05	≥1.05	≥1.1
Power conversion efficiency	%	≥45	≥45	≥50	≥48
Thermal Parameters					
Operating temperature	˚C	15-35			
Storage temperature [6]	˚C	-40 to 60			
Recommended Heatsink Capacity	W	≥90	≥80	≥90	≥120

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˚.
5. Slow axis collimation is available for bars with fill factor ≤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.

	Units	CS01/CS04 -60-825	CS01/CS04 -60-880	CS03 -50-915	CS01/CS04 -915-60	CS01/CS04 -60-940
Optical Specifications [3,8]						
Center wavelength, λ	nm	825 ±3	880 ±3	915 ±3	915 ±3	940 ±3
Output power[2]	W	60	60	50	60	60
Fill factor	%	30	30	20	20	20
Number of emitters	-	19	19	7	19	19
Emitter width	μm	150	150	100	200	100
Spectral width FWHM	nm	≤4	≤3	≤4	≤4	≤4
Spectral width FW90%E	nm	≤7	≤5	≤6	≤7	≤7
Fast axis divergence (FWHM) [4,7]	°	35				
Slow axis divergence (FWHM) [5]	°	8				
Polarization mode	-	TM	TE	TE	TE	TE
Wavelength temp. coefficient	nm/°C	~0.28	~0.30	~0.32	~0.32	~0.33
Electrical Parameters [3,8]						
Operating current, I_{op}	A	≤75	≤70	≤55	≤60	≤60
Threshold current, I_{th}	A	≤17	≤15	≤6	≤8	≤8
Operating voltage, V_{op}	V	≤2	≤2	≤1.85	≤1.85	≤1.85
Slope efficiency	W/A	≥1	≥1.1	≥1.1	≥1.05	≥1.05
Power conversion efficiency	%	≥45	≥50	≥55	≥55	≥55
Thermal Parameters						
Operating temperature	°C	15-35				
Storage temperature [6]	°C	-40 to 60				
Recommended Heatsink Capacity	W	≥120	≥120	≥90	≥120	≥120

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°.
5. Slow axis collimation is available for bars with fill factor ≤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.

	Units	CS03 -50-976	CS01/CS04 -60-976	CS01/CS04 -60-976	CS01/CS04 -80-976
Optical Specifications [3,8]					
Center wavelength, λ	nm	976 ±3	976 ±3	976 ±3	976 ±3
Output power[2]	W	50	60	60	80
Fill factor	%	20	30	20	30
Number of emitters	-	7	19	19	19
Emitter width	μm	100	150	100	150
Spectral width FWHM	nm	≤5	≤4	≤4.5	≤4
Spectral width FW90%E	nm	≤8			
Fast axis divergence (FWHM) [4,7]	°	35			
Slow axis divergence (FWHM) [5]	°	8			
Polarization mode	-	TE			
Wavelength temp. coefficient	nm/°C	~0.34			
Electrical Parameters [3,8]					
Operating current, I_{op}	A	≤55	≤65	≤65	≤86
Threshold current, I_{th}	A	≤5	≤7	≤6	≤10
Operating voltage, V_{op}	V	≤1.85			
Slope efficiency	W/A	≥1	≥1.05	≥0.95	≥1
Power conversion efficiency	%	≥55	≥55	≥50	≥55
Thermal Parameters					
Operating temperature	˚C	15-35			
Storage temperature [6]	˚C	-40 to 60			
Recommended Heatsink Capacity	W	≥90	≥120	≥120	≥140

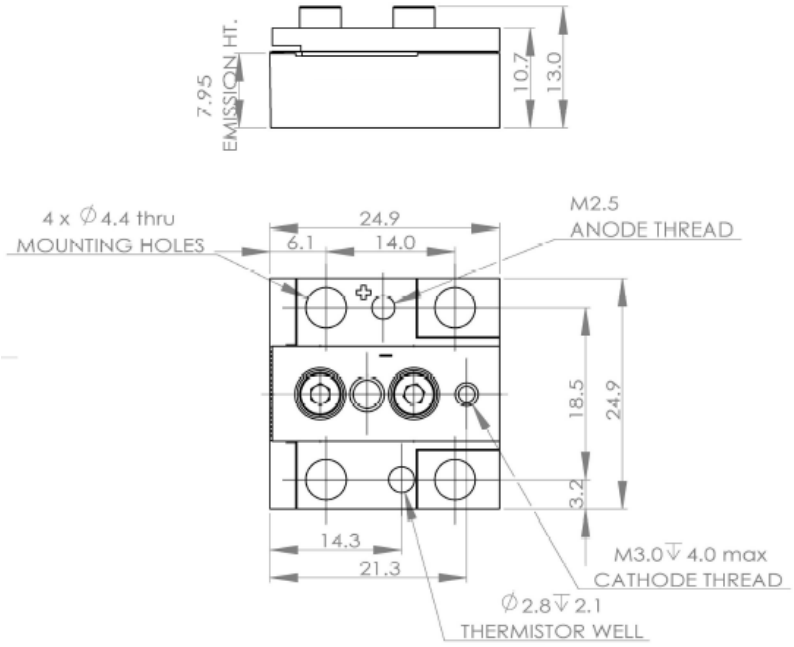
2. Reduced lifetime if used above nominal operating conditions.
3. Data at 25˚C temperature, unless otherwise stated.
4. For fast axis collimation: divergence <0.5˚.
5. Slow axis collimation is available for bars with fill factor ≤30%.
6. A non-condensing environment is required for storage and operation below ambient dew point.
7. For smile requirements, please contact us.
8. If there are any other requirements, please contact us.

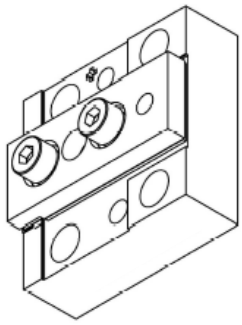
	Units	CS01/CS04 -20-1470	CS01/CS04 -20-1550
Optical Specifications [3,8]			
Center wavelength, λ	nm	1470 ±3	1550 ±3
Output power[2]	W	20	
Fill factor	%	20	
Number of emitters	-	19	
Emitter width	μm	100	
Spectral width FWHM	nm	≤10	≤15
Spectral width FW90%E	nm	-	
Fast axis divergence (FWHM) [4,7]	°	32	
Slow axis divergence (FWHM) [5]	°	8	
Polarization mode	-	TE	
Wavelength temp. coefficient	nm/°C	~0.4	
Electrical Parameters [3,8]			
Operating current, I_{op}	A	≤60	≤80
Threshold current, I_{th}	A	≤5	≤8
Operating voltage, V_{op}	V	≤1.3	
Slope efficiency	W/A	≥0.35	≥0.25
Power conversion efficiency	%	≥25	≥20
Thermal Parameters			
Operating temperature	˚C	15-35	
Storage temperature [6]	˚C	-40 to 60	
Recommended Heatsink Capacity	W	≥70	

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˚.
5. Slow axis collimation is available for bars with fill factor ≤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.

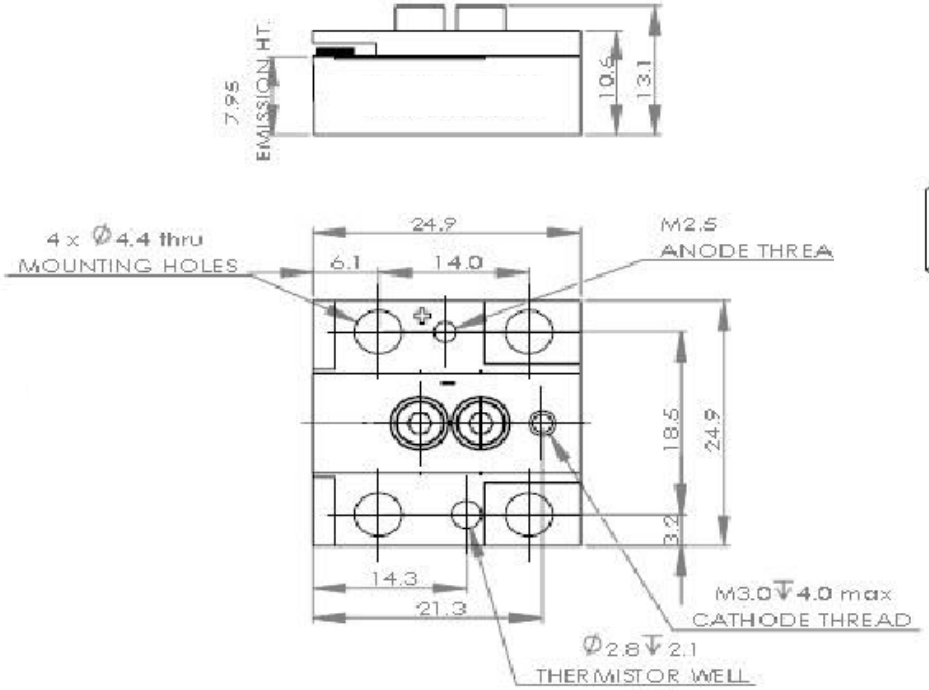
Dimensions Diagram (measurements in mm unless specified)

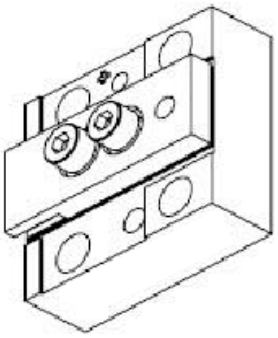
- CS01



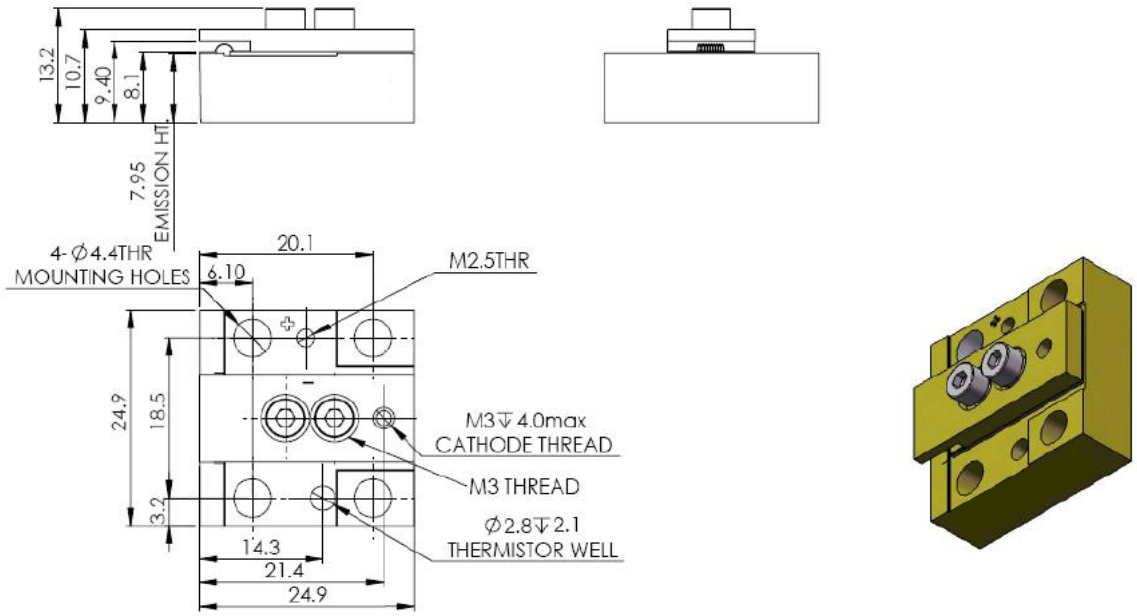


- CS03





- CS04



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.

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 fire 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.