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CPS196 - Mar. 06, 2015

Item # CPS196 was discontinued on Mar. 06, 2015. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

- **Wavelengths from 405 nm to 980 nm**
- **Collimated and Adjustable-Focus Versions**
- **Compact Ø8 mm or Ø11 mm Housing Options**
- **850 nm Single-Wavelength Laser Module**

CPS635F
Adjustable-Focus Laser Module
Power Supply Not Included

CPS532
Collimated Laser Module
Power Supply Not Included

CPS850V
Single-Wavelength Laser Module
Power Supply Not Included

Hide Overview

OVERVIEW

Features

- Collimated or Adjustable-Focus Laser Diode Modules
- Compact Ø8 mm or Ø11 mm Housing Makes these Modules Ideal as Alignment Lasers
- Lasing at Wavelengths from 405 nm to 980 nm (See Table to the Right)
  - Five 635 nm Wavelength Options Provide Alternatives to HeNe Lasers
  - 635 nm Kit Includes the Laser Module, Power Supply, and Mounting Mechanics
- Single-Wavelength VCSEL Collimated Laser Module for 850 nm Available
- Power Supplies are Not Included with Individual Laser Diode Modules (Sold Separately Below)

Quick Link Guide
Laser Diode Modules
405 nm - 532 nm
635 nm
635 nm Kit
650 nm - 780 nm
780 nm
808 nm - 980 nm
850 nm VCSEL
Accesories
Mounting Adapters
5 VDC Power Supply

Click to Enlarge
CPS980 Module Held in an AD11F SM1-Threaded Adapter and Mounted into a CP90F Quick-Release Cage Plate Within a 30 mm Cage System

Click to Enlarge
CPS450 Laser Diode Module Held in a KAD11NT Unthreaded Kinematic Adapter and Mounted into an FMP1 Fixed Optic Mount

Click to Enlarge
CPS850 Laser Diode Module Held in an AD11NT Unthreaded Adapter and Mounted into a KM100 Kinematic Mount

Click to Enlarge
CPS980S Laser Diode Module Held in an AD8F SM1-Threaded Adapter and Mounted into an LM1XY XY Translation Mount

Thorlabs' Laser Diode Modules are available in either collimated or adjustable-focus varieties and provide output powers ranging from 0.85 mW to 4.5 mW (laser safety Class 2, 3R, or 3B depending on the model). Each module has an output beam shape that is either elliptical or round, as indicated in the tables below. These modules, which offer single spatial mode output and a compact cylindrical housing, are ideal for use as alignment lasers in optical systems.

For single-frequency applications, our collimated 850 nm VCSEL Module produces a single-wavelength output and a round, Gaussian beam shape without clipping the beam. This laser module features a 2 to 3 order of magnitude narrower linewidth than our other laser modules, but this comes at the expense of a lower total power output.

Each module requires a 5 VDC power supply (not included), such as the LDS5 offered below, to operate. Alternatively, a 2.5 mm phono plug is included for customers who wish to wire their own power supply to the laser module. These diode modules have either a 18" (457 mm) or 24" (610 mm) long cable, with a 2.5 mm phono socket for connection to a power supply.

Mounting Options

The Ø8 mm and Ø11 mm housings are compatible with our line of optomechanical components through the use of various mounting adapters, as shown in the images to the right. Depending on the adapter chosen, these laser modules can be directly mounted into either internally SM1-threaded (1.035"-40) components or mechanics with a Ø1" bore. Further details on each adapter and its compatibility with our line of optomechanics can be found below.

Please note that the knurled knob used for focus adjustment on the CPS635F, CPS650F, and CPS670F laser modules is too large for the mounting adapter bore. This knob can be unthreaded to mount the diode module in the same manner as the collimated versions. Please make sure to loosen the setscrews locking the knob in place before unthreading; not doing so can damage the threading. Alternatively, the module can be mounted by threading the cord and phono plug through the adapter first.

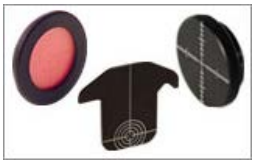
Hide Laser Safety

LASER SAFETY

Laser Safety and Classification

Safe practices and proper usage of safety equipment should be taken into consideration when operating lasers. The eye is susceptible to injury, even from very low levels of laser light. Thorlabs offers a range of laser safety accessories that can be used to reduce the risk of accidents or injuries. Laser emission in the visible and near infrared spectral ranges has the greatest potential for retinal injury, as the cornea and lens are transparent to those wavelengths, and the lens can focus the laser energy onto the retina.

Safe Practices and Light Safety Accessories



- Thorlabs recommends the use of safety eyewear whenever working with laser beams with non-negligible powers (i.e., > Class 1) since metallic tools such as screwdrivers can accidentally redirect a beam.
- Laser goggles designed for specific wavelengths should be clearly available near laser setups to protect the wearer from unintentional laser reflections.
- Goggles are marked with the wavelength range over which protection is afforded and the minimum optical density within that range.
- Laser Barriers and Blackout Materials can prevent direct or reflected light from leaving the experimental setup area.
- Thorlabs' Enclosure Systems can be used to contain optical setups to isolate or minimize laser hazards.
- A fiber-pigtailed laser should always be turned off before connecting it to or disconnecting it from another fiber, especially when the laser is at power levels above 10 mW.
- All beams should be terminated at the edge of the table, and laboratory doors should be closed whenever a laser is in use.
- Do not place laser beams at eye level.
- Carry out experiments on an optical table such that all laser beams travel horizontally.
- Remove unnecessary reflective items such as reflective jewelry (e.g., rings, watches, etc.) while working near the beam path.
- Be aware that lenses and other optical devices may reflect a portion of the incident beam from the front or rear surface.
- Operate a laser at the minimum power necessary for any operation.
- If possible, reduce the output power of a laser during alignment procedures.
- Use beam shutters and filters to reduce the beam power.
- Post appropriate warning signs or labels near laser setups or rooms.
- Use laser sign lightboxes if operating Class 3R or 4 lasers (i.e., lasers requiring the use of a safety interlock).
- Do not use Laser Viewing Cards in place of a proper Laser Barrier or Beam Trap.

Laser Classification

Lasers are categorized into different classes according to their ability to cause eye and other damage. The International Electrotechnical Commission (IEC) is a global organization that prepares and publishes international standards for all electrical, electronic, and related technologies. The IEC document 60825-1 outlines the safety of laser products. A description of each class of laser is given below:

Class	Description	Warning Label
1	This class of laser is safe under all conditions of normal use, including use with optical instruments for intrabeam viewing. Lasers in this class do not emit radiation at levels that may cause injury during normal operation, and therefore the maximum permissible exposure (MPE) cannot be exceeded. Class 1 lasers can also include enclosed, high-power lasers where exposure to the radiation is not possible without opening or shutting down the laser.	
1M	Class 1M lasers are safe except when used in conjunction with optical components such as telescopes and microscopes. Lasers belonging to this class emit large-diameter or divergent beams, and the MPE cannot normally be exceeded unless focusing or imaging optics are used to narrow the beam. However, if the beam is refocused, the hazard may be increased and the class may be changed accordingly.	

2	Class 2 lasers, which are limited to 1 mW of visible continuous-wave radiation, are safe because the blink reflex will limit the exposure in the eye to 0.25 seconds. This category only applies to visible radiation (400 - 700 nm).	
2M	Because of the blink reflex, this class of laser is classified as safe as long as the beam is not viewed through optical instruments. This laser class also applies to larger-diameter or diverging laser beams.	
3R	Lasers in this class are considered safe as long as they are handled with restricted beam viewing. The MPE can be exceeded with this class of laser, however, this presents a low risk level to injury. Visible, continuous-wave lasers are limited to 5 mW of output power in this class.	
3B	Class 3B lasers are hazardous to the eye if exposed directly. However, diffuse reflections are not harmful. Safe handling of devices in this class includes wearing protective eyewear where direct viewing of the laser beam may occur. In addition, laser safety signs lightboxes should be used with lasers that require a safety interlock so that the laser cannot be used without the safety light turning on. Class-3B lasers must be equipped with a key switch and a safety interlock.	
4	This class of laser may cause damage to the skin, and also to the eye, even from the viewing of diffuse reflections. These hazards may also apply to indirect or non-specular reflections of the beam, even from apparently matte surfaces. Great care must be taken when handling these lasers. They also represent a fire risk, because they may ignite combustible material. Class 4 lasers must be equipped with a key switch and a safety interlock.	
All class 2 lasers (and higher) must display, in addition to the corresponding sign above, this triangular warning sign		

Laser Diode Modules: 635 nm

The laser diode modules shown below have a center wavelength of 635 nm, providing alternatives to HeNe lasers. The power supplies are not included and are sold below. If a full kit is preferred, we also offer the S2011 Laser Diode Module Kit, shown below, that includes a CPS196 laser module, an LDS5 power supply, a KM100T kinematic mount, post assembly, and AD11F Mounting Adapter.

Click Image for Full View (Not to Scale)					
Item #	CPS180	CPS182	CPS635S	CPS196[a]	CPS635F[b]
Collimation	Fixed	Fixed	Fixed	Adjustable	Adjustable
Wavelength (Typical)	635 nm	635 nm	635 nm	635 nm	635 nm
Power (Typical)	1 mW (Class 3R)	4.5 mW (Class 3R)	4.5 mW (Class 3R)	4.5 mW (Class 3R)	4.5 mW (Class 3R)
Beam Shape[c] (Click for Profile)	Ø4 mm	4 mm x 0.6 mm	3.8 mm x 1.2 mm	Collimated 2.45 mm x 0.54 mm	Collimated 5.0 mm x 1.9 mm
Housing Dimensions	Ø11.0 mm x 55 mm	Ø11.0 mm x 42 mm	Ø8.0 mm x 30 mm	Ø11.0 mm x 46 mm	Ø11.0 mm x 54 mm
Specifications					

a. Focus can be adjusted by loosening the knurled locking nut at the front of the laser housing. A lens is located within a threaded body, which will translate the lens as it is rotated. Focus can be locked by reattaching the knurled locking nut.
b. Focus can be adjusted by loosening the knurled knob at the front of the laser housing. As the knob is turned, the lens will translate without rotation. Please note that the rotation of the knob can be locked with two setscrews using the provided 0.9 mm hex wrench.
c. The beam size was measured at a distance of 2" (50.8 mm) from the front of the housing.

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1	Qty	Docs	Part Number - Universal/Imperial		Price	Available / Ships
+1			**CPS180**	Collimated Laser Diode Module, 635 nm, 1 mW, Round Beam, Ø11 mm Housing	$140.00	√ Today
+1			**CPS182**	Collimated Laser Diode Module, 635 nm, 4.5 mW, Elliptical Beam, Ø11 mm Housing	$116.00	√ Today
+1			**CPS635S**	Collimated Laser Diode Module, 635 nm, 4.5 mW, Elliptical Beam, Ø8 mm Housing	$82.00	√ Today
+1			**CPS196**	Adjustable Focus Laser Module, 635 nm, 4.5 mW, Elliptical Beam, Ø11 mm Housing	$150.30	Lead Time
+1			**CPS635F**	Adjustable Focus Laser Diode Module, 635 nm, 4.5 mW, Eliptical Beam, Ø11 mm Housing	$99.80	√ Today

Add To Cart

CPS196 - Adjustable Focus Laser Module, 635 nm, 4.5 mW, Elliptical Beam, Ø11 mm Housing

Specifications | Drawing

General Specifications	
Characteristic	
Housing Material	Aluminum
Housing Dimensions	Ø11.0 mm x 46 mm
Collimated Beam Size[a]	Elliptical, 2.45 mm x 0.54 mm
Operating Temperature	-10 to 40 °C
Storage Temperature	-40 to 85 °C
Operating Voltage	-4.5 V to -5.5 V
Laser Safety Class	3R
Individual Data Sheet[b]	Yes
Mounting Adapters	AD11F, AD11NT, KAD11F, KAD11NT
Compatible Power Supply (Not Included)	LDS5

a. The beam size was measured at a distance of 2" (50.8 mm) from the front of the housing.
b. This product ships with individual test data sheet that includes the center wavelength, power stability, and operating current.

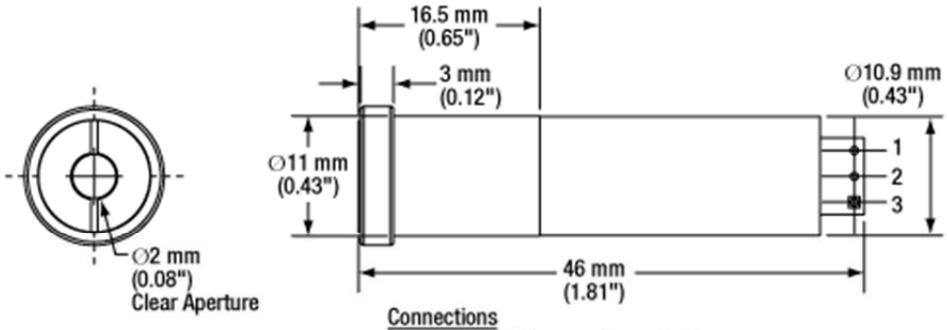
Optical Electrical Characteristics				
Characteristic	**MIN**	**TYP**	**MAX**	**UNIT**
Wavelength	-	635	640	nm
Optical Output Power (CW)	-	-	4.5	mW
Axis Deviation[a]	-	7	15	mrad
Collimated Beam Divergence (Parallel)	-	-	0.6	mrad
Collimated Beam Divergence (Perpendicular)	-	-	1.8	mrad
Focal Range (From Exit Window)	50	-	Collimated	mm
Focused Spot Diameter (400 mm, FWHM)	-	75 x 300	-	µm
Operating Current (CW)	-	55	-	mA

a. Max Axis Deviation is the parallelism between the module housing and the output beam.

Auto CAD PDF | Solidworks | Step | Spec Sheet

CPS196 - Adjustable Focus Laser Module, 635 nm, 4.5 mW, Elliptical Beam, Ø11 mm Housing

Specifications | Drawing



Connections

Pin	Description	Phono Jack
1	-5V	Red/Outer
2	NC	None
3	GND	Black/Center

Auto CAD PDF | Solidworks | Step | Spec Sheet