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THORLABS

TCLDM9 - November 13, 2017

Item # TCLDM9 was discontinued on November 13, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

TEMPERATURE CONTROLLED MOUNT FOR Ø5.6 MM OR Ø9 MM LASER DIODES

- **Compatible with Many Ø5.6 mm and Ø9 mm Laser Diodes**
- **Features TEC Lockout Circuit**
- **Selectable Laser Diode Polarity**

TCLDM9
Laser Diode
Mount

TCLDM9DJ
DPSS Laser Diode Adapter

TCLDM9 and with Aspheric Le

Mounted in S1TM09 Adapter

Hide Overview

OVERVIEW

Features

- Integrated TEC Element for Temperature Controlled Operation of a Laser Diode
- Compatible with Many 3- and 4- Pin Laser Diodes in Ø9 mm or Ø5.6 mm Packages
- Compatible with Thorlabs' DPSS Laser Diodes when Used with a TCLDM9DJ Mounting Flange
- Integrated Bias-T Adapter Allows for RF Modulation of the Laser Current up to 500 MHz
- 30 mm Cage System Compatible
- SM1 Lens Tube Compatible
- Integrated TEC Lockout Circuit to Protect LD (Can Be Disabled)
- 8-32 and M4 Tapped Holes for Easy Post Mounting

The TCLDM9 mount is ideal for temperature-controlled operation of all Thorlabs' 3-pin and 4-pin laser diodes in Ø9 mm and Ø5.6 mm TO Can packages. The mount can control the laser diode and monitor photodiode independently making it compatible with a wide variety of laser diodes including all three-pin style A, B, and C configuration laser diodes as well as all four-pin style D laser diodes. The mount is also compatible with all style E and F two-pin laser diodes (style G configurations are also compatible; however modifications to the mount are required, see the *Specs* and *Pin Configuration* tabs for details). A version of the TCLDM9 that is compatible with a 3- or 4-pin style F configuration is available upon request. For questions about this mount or other questions about the compatibility of our style F laser diodes, or any other configuration, please contact tech support. We also offer TE-cooled mounts for Ø3.8 mm

Click to Enlarge

The LTC100 Series Kit includes a current controller, temperature controller, and the TCLDM9 mount featured on this page. In addition, each kit includes a mounted aspheric lens and other accessories as pictured. The kit price is 10% lower than the total price of the individual components.

laser diodes and for pigtailed TO can laser diodes.

Laser diodes can be quickly and easily changed in the mount. It is as simple as inserting the laser diode into the socket according to the imprinted pin assignment and fastening the clamp ring with two screws. The diode socket is located very close to the front of the cold plate making the connection of short lead devices easier. The pass-through design of the socket lets you install long lead diodes (up to 3/4") without trimming. Further details are available in the *Pin Configuration* and *LD Collimation* tabs.

The TCLDM9 can be easily integrated into any existing optical setup. The bottom surface of the TCLDM9 provides 8-32 and M4 mounting holes, and its front plate is equipped with tapped holes to mount our 30 mm Cage System and SM1 threading for use with our Lens Tube Assemblies. The laser diode socket is conveniently centered within the housing and is 1.75" (44.5 mm) above the tapped post mounting holes.

The TCLDM9 includes a Bias-T for RF modulation of the laser current up to 500 MHz. The mount can be adapted to the polarity of the laser diode and monitor diode by miniature switches located at the top of the mount. User protection features include an LED indicating an enabled laser located along the top of the mount and a remote interlock connector located on the side.

Laser protection features include optional grounding configurations, and the 'TEC Lockout' circuit* (also included in our 14-Pin Butterfly Laser Diode Mounts) that prevents enabling the laser unless the TEC controller is active. The built-in TE cooler enables temperature-controlled operation of the laser diode. The clamp ring protects the laser diode against air drafts, thus temperature stabilities of about 10 mK can be achieved.

*TEC Lockout only functions with Thorlabs laser and TEC controllers and can be easily bypassed if not required.

Hide Specs

SPECS

TCLDM9 Specifications	
Laser Diode Package	Ø5.6 mm & Ø9 mm
Supported Pin Configurations	A, B, C, D, E, H, and G (With Some Modification, See *Pin Configurations* Tab)
Accepted Pin Diameter Leads	0.015" - 0.020" (0.38 mm - 0.51 mm)
Laser Current (Max)	2 A
Polarity of Laser Diode	Selectable
Polarity of Monitor Diode	Selectable
RF Power (Max)	200 mW, RMS
RF Input Impedance	50 Ω
Modulation Frequency (Bias-T)	0.1 to 500 MHz
TEC Current (Max)	5 A
TEC Voltage (Max)	4 V
TEC Heating/ Cooling Capacity	20 W
TEC Interface	DB9, Male
Temperature Sensor	AD592, 10 kΩ Thermistor
Temperature Range (@25 °C with 2 A TEC Current)	5 to 70 °C

Hide Pin Configurations

PIN CONFIGURATIONS

Laser Diode Pin Configurations

Thorlabs offers several different laser diodes that emit in the UV, visible, and IR. Many laser diode packages also include a built-in monitor photodiode, and the electrical connections for the diodes vary based on the internal circuitry of the package. Thorlabs labels these different configurations, shown

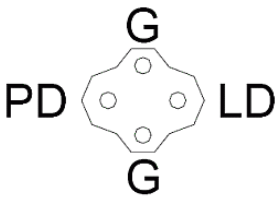
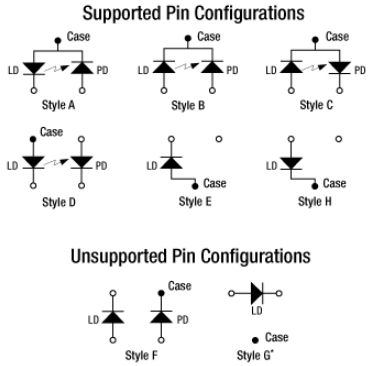


Figure 2. TCLDM9 Standard Configurations

in Figure 1, as Styles A through F. Thorlabs notes the pin configuration styles of the diodes we offer both in the specifications provided on our website and on the specification sheets included with the diodes. To determine the style of any laser diode package, compare its pin diagram supplied with the styles shown in Figure 1. Use the style type, pin configuration, and the following information to properly power the laser diode.



*Style G is Supported with Modifications to the TCLDM9

Figure 1: Supported and Unsupported Pin Configurations

The TCLDM9 TEC Laser Diode Mount is compatible with all three-pin Ø5.6 mm and Ø9 mm laser diode packages that have a A, B, or C pin configuration style as depicted in Figure 1. These configurations include both a laser diode and a monitor photodiode, and the packages feature a common Ground (G) pin and independent control of the Laser Diode (LD) and Photodiode (PD) voltages.

The TCLDM9 mount is also compatible with all of our currently available four-pin laser diodes possessing a Style D configuration (see Figure 1). As with Style A, B, and C laser diodes, Style D laser diodes feature a laser diode and monitoring photodiode; however, the photodiode floats with respect to the case in Style D packages.

Please note that while Style D and Style F packages appear similar, the TCLDM9 mount is NOT compatible with Style F four-pin package configurations. The Style F pin configuration, has a pin layout that prohibits use in the TCLDM9 mount. For more information, see the sections below or contact tech support.

Figure 3. TCLDM9 Internal Circuitry Showing Jumper J4
Click to Enlarge

The TCLDM9 Mount is compatible with Style E and H laser diodes, which do not possess a monitor photodiode. These are three-pin packages that include a laser diode pin and a ground pin, as shown to the right in Figure 1. The TCLDM9 is also compatible with Style G laser diodes; however, modifications of the TCLDM9 Mount are required as discussed below.

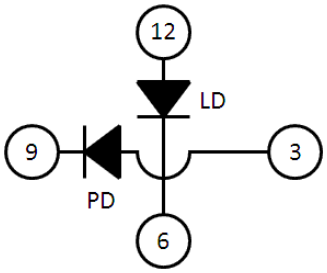


Figure 4. Unsupported Style F Configuration

TCLDM9 Mounting Configuration

The TCLDM9 Laser Diode Mount has a standard four-pin LD and PD mounting configuration. Both LD and PD connections can be made according to the diagram in Figure 2. Please note the orientation of the laser diode configuration (top/bottom and front/back) as it may vary between manufacturers, product lines, and/or configurations. The pin numbering convention on the laser diode manuals may differ as well.

The TCLDM9 configuration is directly compatible with laser diode packages Style A, B, C, D, and E. Using this mount to with Style G laser diodes requires making modifications to the mount. Please see the next section for more details.

Style F laser diodes are incompatible with the TCLDM9 mount. The pin layout of the Style F package places the LD and PD pins next to each other, instead of across from each other as is required by the mount (see Figure 2, which shows that the LD and PD sockets are located across from one another). The *Incompatible Style F Configuration* section that follows provides additional detail.

Style G Configuration

Style G configurations feature only a laser diode in the package; no photodiode is present. As the LD and ground pins are directly across from each other (i.e. in the LD and PD positions or 3 and 9 o'clock positions), modifications must be made to the TCLDM9 mount.

In order to drive a style G laser diode, the PD pin in the mount must be grounded. To ground the PD pin, remove the front cover to the TCLDM9 mount. Locate jumper J4 on the right-hand side of the mount. A photo of the TCLDM9 internal circuitry is shown in Figure 3, and jumper J4 is marked with a red arrow. Short J4 pin 3 (ground, right pin) to J4 pin 2 (photodiode, middle pin). Grounding the photodiode pin will allow the mount to drive a laser diode only (no photodiode) configuration with the LD pins at the 3 o'clock and 9 o'clock positions.

Note: In this configuration, the PD pin will be the ground pin. Proper mounting of the laser diode anode and cathode is required. In order to use the mount with any other laser diode style will require undoing the modification performed above.

Incompatible Style F Configurations

The TCLDM9 is not compatible with any Style F connections, even though the configuration is very similar to the Style D configuration.

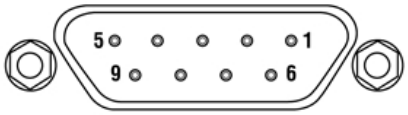
The 90 mW HL6548FG laser diode, which emits at 660 nm, features a Style F configuration. A schematic showing the internal circuitry of the laser diode is shown in Figure 4. The incompatibility stems from the arrangement of the PD and LD pins. Style F packages locate the PD and LD pins diagonally from one another (9 and 12 o'clock positions, or any adjacent position). With this configuration, it is not possible to apply the correct voltage bias across both diodes simultaneously using the TCLDM9 laser diode mount.

A version of the TCLDM9 that is compatible with a Style F configuration is available upon request. For questions about this mount or other questions about the compatibility of our Style F laser diodes, or any other configuration, please contact tech support.

Hide Pin Diagrams

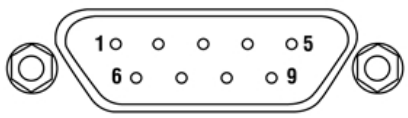
PIN DIAGRAMS

LD Driver: D-Type Female



Pin	Signal	Description
1	Interlock and Status Pin (LDC Specific)	Laser Diode (LD) Status Indicator and Interlock Circuits input.
2	Photodiode Cathode	This pin is connected to the 9 o'clock pin on the laser socket when the photodiode (PD) polarity switch is set to anode ground (AG). It is attached to ground and the 12 o'clock and 6 o'clock pins on the laser socket when the PD polarity switch is set to cathode ground (CG).
3	Laser Ground (Case)	This pin is connected to the 12 o'clock and 6 o'clock pins on the laser socket and corresponds to the settings of the LD and PD polarity switches (i.e. If the LD and PD switches are set to AG then this pin grounds the anodes of the laser and photodiodes).
4	Photodiode Anode	This pin is connected to the 9 o'clock pin on the laser socket when the PD polarity switch is set to CG. It is attached to ground and the 12 o'clock and 6 o'clock pins on the laser socket when the PD polarity switch is set to AG.
5	Interlock and Status Return	Status and interlock circuitry return.
6	Laser Diode Voltage (Cathode)	This pin is connected to LD interface pin 7, through a 499 Ω resistor, when the LD polarity switch is set to AG. It is attached directly to LD interface pin 3 when the LD polarity switch is set to CG.
7	Laser Diode Cathode	This pin is connected to the 3 o'clock pin on the laser socket when the LD polarity switch is set to AG, and it floats otherwise.
8	Laser Diode Anode	This pin is connected to the 3 o'clock pin on the laser socket when the LD polarity switch is set to CG, and it floats otherwise.
9	Laser Diode Voltage (Anode)	This pin is connected to LD interface pin 8, through a 499 Ω resistor, when the LD polarity switch is set to CG. It is attached directly to LD interface pin 3 when the LD polarity switch is set to AG.

TEC Controller: D-Type Male

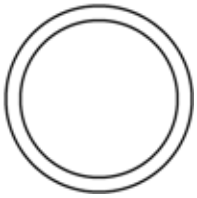


Pin	Signal	Description
1	TEC Lockout (+)	This pin is connected to the anode of the photo-relay side of the TEC Lockout circuit. When using Thorlabs TEDs no external circuitry is required. To use these features with third-party controllers please refer to the Status and Interlock section of this manual.
2	+Thermistor	The 10 kΩ at 25 °C NTC thermistor (provided for temperature feedback).
3	-Thermistor	The thermistor return pin.

4	+TEC	This pin is connected to the positive terminal of the TEC element.
5	-TEC and TEC Lockout (-)	This pin is connected to the negative terminal of the TEC element, and also is common to the cathode of the photo-relay of the TEC Lockout circuit - refer to the Status and Interlock section of this manual.
6	N.C.	Not Used.
7	AD592(-)	The negative terminal of the AD592 temperature transducer. When using Thorlabs TEDs no external circuitry is required. To use this device with third party controllers it must be properly biased. Refer to Analog Devices AD592 Data for application information.
8	N.C.	Not Used.
9	AD592(+)	The positive terminal of the AD592

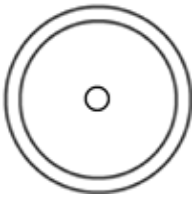
Optional Remote Interlock

2.5 mm Female Mono Phono Jack



RF Laser Modulation Input*

SMA Female



Specifications	Value
Type of Mating Connector	2.5 mm mono phono jack
Open Circuit Voltage	+5 VDC with respect to system ground (when used in conjunction with Thorlabs drivers)
Short Circuit Current	10 mA DC Typical
Connector Polarity	Tip is positive, barrel is ground
Interlock Switch Requirements	Must be N.O. dry contacts (under no circumstances should any external voltages be applied to the Interlock input)

*RF input for modulation with an external source up to 500 MHz. This is a 50 Ω input that is AC-couples directly to the laser through a Bias-Tee network.

Hide Electronic Control

ELECTRONIC CONTROL

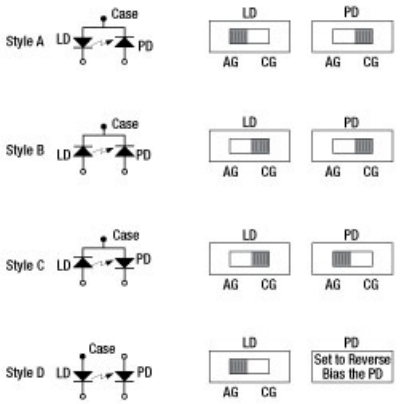
Electronic Assembly and Control

The TCLDM9 can drive any laser diode requiring a drive current up to 2 A. A 50 Ω radio frequency (RF) input using a bias-tee allows direct modulation of the laser diode up to 500 MHz and 200 mW. The mount also provides two thermoelectric cooler (TEC) elements with 10 W of cooling power each. The TEC elements have a maximum current of 5 A at a maximum voltage of 4 V. Full details of the assembly and operation of the TCLDM9 Mount can be found in the operating manual and spec sheet, and the following gives an overview of the TCLDM9 electronic assembly and operation, as well as provide options for powering the laser diode and temperature controller.

Laser Diode Controllers

The laser diode current controller should be chosen to be compatible with the particular laser diode and application. Thorlabs offers a wide variety of laser diode controllers ranging from low power (low current and low voltage) to high power (high current and/or voltage) versions. Thorlabs also offers several dual laser diode current/temperature controllers and kits. See the *TEC Controllers* section that follows for discussion of the temperature controllers.

Thorlabs' LDC2xxC series of controllers are suitable for use with a large majority of popular laser diodes. Thorlabs' LDC200CV is specifically designed to handle and safely operate Vertical Cavity Surface Emitting Lasers (VCSELs), while the LDC201CU provides users with an ultra-low noise current (<0.2 µA RMS) for stable operation of low power laser diodes. If your application requires the higher voltages typically necessary for driving blue and other short laser diodes, consider our LDC202C, LDC205C, or LDC210C controller. For driving higher power laser diodes, the LDC220C and LDC240C offer drive currents of 2 A and 4 A, respectively. Higher current (5 and 20 A), T-Cube-compatible, and rack mount controllers are also available. All of these controllers operate in a similar manor. Only the LDC2xxC series controllers will be discussed in more detail.



Click to Enlarge

Figure 1. Pin Styles and Polarity Switch Settings
The gray, ribbed square indicates whether to select anode ground (AG) or cathode ground (CG) mount settings for these laser diodes (LD) and photodiodes (PD). The correct polarity switch setting for Style D's PD depends on the pin configuration of the diode. Please see the text for details.

Prior to installing a laser diode in the mount, the pin configuration style must be determined and the mount properly configured to power the diode. There are two switches located on the top of the mount that control the polarity of the laser diode and monitor photodiode, if present.

The four pin configurations styles shown schematically in Figure 1 (A, B, C, and D) are completely compatible with the TCLDM9 mount. Styles A, B, and C are similar in that they all have three pins, and one pin is shorted to the case (tied to ground). The style type is determined by whether it is the anode or the cathode that is connected to that grounded pin for each the laser diode and the photodiode. Style D is different in that it has four pins, one of which is shorted to the case. The anode of the laser diode is connected to the pin that is shorted to the case, and the photodiode pins float with respect to the case.

The two polarity switch settings on the TCLDM9 mount are constrained for Styles A, B, and C as a result of the three-pin style of their package and the fact that one pin is shorted to the case. The switch settings, which are set to apply a reverse bias across each diode, are also shown in Figure 1. The Style D package has four pins, and the specific laser diode and photodiode pin assignments are determined by the manufacturer. Figure 1 gives the polarity switch setting for the Style D laser diode with the assumption that the cathode and anode of the laser diode have been inserted into the mount's LD and GD sockets, respectively. As the laser diode's pin assignments do not restrict how the cathode and anode of the photodiode are connected to the remaining two pins, it is necessary to consult the manufacturer's pin diagram to determine whether the AG or CG polarity switch setting on the mount will reverse bias the photodiode, as is desired.

A fifth configuration, Style E, may be directly compatible with the mount or may require modification to the mount depending on the orientation of the laser diode pins. These laser diodes do not have a monitor photodiode, and therefore, the mount may be altered to accommodate some style E pin layouts. See the *Pin Configurations* tab for more information on Style E compatibility and necessary modifications to the mount.

Style F laser diodes are not compatible with the TCLDM9 mount. These laser diodes also feature a monitor photodiode; however, the pin layout prohibits the mount from powering the laser diode and photodiode simultaneously. Please see the *Pin Configurations* tab for more information.

Once the pin configuration is set, the controller can be connected to the mount via the DB9 male cable. The LDC2xxC series of controllers is preconfigured to interface directly with the mount. If a third-party controller is used, see the laser diode connector pin configuration in the operating manual to determine the proper connections.

RF Modulation

Modulation of a laser diode is possible but not via the laser diode controller. The input from the laser diode controller is sent through an inductor that only allows low bandwidth, DC currents to pass through to the laser diode. To allow high frequency modulation of the laser diode, the mount's built-in bypass needs to be used to circumvent the low pass filter. The bypass is accessed through an SMA connector on the side of the mount, is directly coupled to the laser using a bias-tee network, and features a 50 Ω RF input that can accept an AC-coupled RF source up to 500 MHz.

In order to properly modulate the laser diode emission, the correct modulation voltage must first be determined. The modulation voltage, V_{RF}, is determined from the product of the laser diode modulation current, I_{LD}, and the input impedance, Z_{input}:

$$V_{RF} = I_{LD} * Z_{input} \quad (1)$$

I_{LD} is given by the manufacturer, and Z_{input} is the impedance of the mount, which is equal to 50 Ω.

When setting the modulation voltage, it is recommended to start at a factor of 10 lower than the value determined from Eq. 1. The modulation voltage can then be slowly increased until V_{RF} or the desired modulation is achieved. The laser diode controller can then be used to increase DC voltage to the proper level.

Warning: The RF input is directly coupled to the laser diode. There is no suppression of noise or other spurious signals to the laser diode. Stable and clean RF sources should be used to avoid overdriving the laser diode. In addition, the laser diode can be easily overdriven by an RF voltage above the specified

level in Eq. 1. Take care when controlling and adjusting the RF voltage to avoid damage to the laser diode.

TEC Controllers

Thorlabs also offers a wide variety of TEC controllers as stand-alone units, dual laser diode/ temperature controllers, and kits. The TED200C benchtop temperature controller is ideally suited to regulate the temperature of a laser diode mounted in the TCLDM9. This unit features a wide operating temperature range, 12 W of cooling, and high temperature stability. For more cooling power and even higher temperature stability, the TED4015 225 W temperature controller can be used.

The TEC elements in the TCLDM9 can be connected to a temperature controller via the DB9 female connection on the side of the unit. Adapter cables are available for temperature controllers with other connector types. For third-party controllers, please see the operating manual for pin layouts and descriptions. Follow the instructions for the TEC controller, paying careful attention not to overdrive the TEC elements in the mount.

Hide LD Collimation

LD COLLIMATION

Choosing Collimation and Astigmatic Correction Optics for Your Laser Diode

Since the output of a laser diode is highly divergent, collimating optics are necessary. Due to their excellent ability to correct spherical aberration, aspheric lenses are the most commonly used optics when the desired collimated beam waist is between one and five millimeters. Choosing an appropriate aspheric lens for collimating a laser diode is essential, as the desired beam size and transmission range are dependent on the lens used. To calculate the beam size of a collimated laser diode, we first need to know its divergences.

The output of an edge emitting laser diode is also highly astigmatic; the beam divergences will be different in the parallel and perpendicular directions, leading to an elliptical beam. This can be compensated for by inserting anamorphic prism pairs or cylindrical lenses after the beam is collimated.

The divergences for a laser diode are typically specified as "Beam Divergence (FWHM) - Parallel" and "Beam Divergence (FWHM) - Perpendicular" for the two axes of the chip. There are variations from lot to lot of laser diodes, but using the typical divergence values should be adequate for most applications. A simple example will illustrate the key specifications to consider when choosing the correct optics for a given application.

Example: 785 nm, 25 mW Laser Diode, L785P025, Ø3 mm Desired Collimated

Step 1: Collimating Emission

The specifications for the L780P010 laser diode indicate that the typical perpendicular and parallel beam divergences are 30^{o} and 10^{o}, respectively. The major (perpendicular) beam divergence is shown in Figure 1. The minor (parallel) beam divergence is shown in Figure 2. Because of this astigmatism or asymmetry in the two axes, an elliptical beam will form as the light diverges. To collect as much light as possible during the collimation process, consider the larger of these two divergence angles in any calculations (i.e., in this case use 30^{o}).

Note: Parallel and perpendicular notation are specified relative to the junction plane of the laser diode.

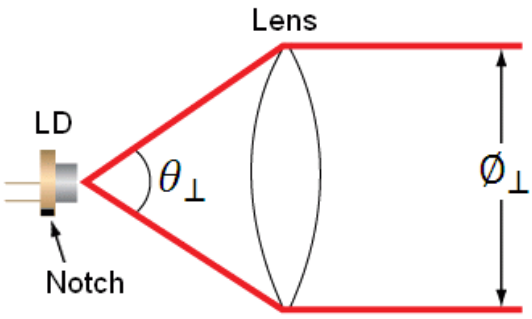


Figure 1. Perpendicular beam divergence from L785P025 style A laser diode

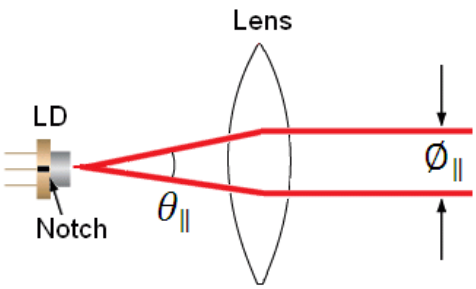


Figure 2. Parallel beam divergence from L785P025 style A laser diode

In the above schematics, LD denotes the laser diode, $\varnothing_{\parallel}$ and $\varnothing_{\perp}$ are the beam diameters in the parallel and perpendicular orientations, respectively, and $\theta_{\parallel}$ and $\theta_{\perp}$ are the divergence angle in the parallel and perpendicular orientations, respectively. Please note that the notch in Figures 1 and 2 can be used to determine the orientation of the laser diode within the package. Laser diodes are typically oriented parallel to the notch; however there are many exceptions,

especially for different laser diode packagings. Care should be taken to properly orient the laser diode and laser diode emission.

To calculate the focal length needed to acheive a Ø3 mm collimated beam diameter, we can use:

$$f = \frac{\frac{\varnothing_{\perp}}{2}}{\tan\left(\frac{\theta_{\perp}}{2}\right)} \qquad (1)$$

where f is the focal length that produces the desired perpendicular beam diameter, $\varnothing_{\perp}$. The focal length of the lens needed to collimate a 30^{o} diverging beam into a Ø3 mm collimated beam is f = 5.6 mm.

Equation 1 yields the focal length to achieve our desired major (perpendicular) axis diameter. Use this to then select an aspheric lens with a focal length that most closely matches the focal length given by the equation. Please note that the diameter of the lens must be larger than your desired major axis beam diameter.

Thorlabs offers a large selection of aspheric lenses. For this application, the ideal lens is an -B AR-coated molded glass aspheric lens with focal length near 5.6 mm. The C170TME-B (mounted) or 352170-B (unmounted) aspheric lenses have a focal length of 6.16 mm. Next, check to see if the numerical aperture (NA) of the diode is smaller than the NA of the lenses so that the light emitted from the laser diode is not clipped by the lens:

$$\underset{\text{Lens}}{\text{NA}} > \underset{\text{Diode}}{\text{NA}} \sim \sin(15) = 0.26 \qquad (2)$$

Solving Eq. 1 again with your actual focal length and major axis divergence angle yields the actual major axis beam diameter, $\varnothing_{\perp}$ = 3.3 mm.

Step 2: Correcting Astigmatism

Emission from an edge emitting laser diode is astigmatic (asymmetric with respect to two different axes), as shown in Figures 1 and 2. To correct for this and produce a circular beam, the minor axis diameter, $\varnothing_{\parallel}$, can be magnified using anamorphic prism pairs or cylindrical lenses after collimation. Figure 3 shows an anamorphic prism pair magnifying an elliptical beam minor axis to produce the desired symmetric beam.

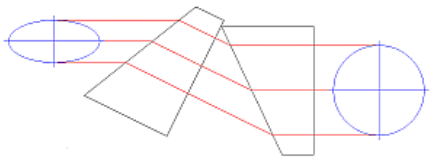


Figure 3. Anamorphic Prism Pair and optic trace for an ellipse to round beam.

To determine what magnification of the minor axis is needed to produce a round beam, solve Eq. 1 using the focal length from the aspheric lens, f = 6.16 mm, and minor axis divergence for the laser diode, $\theta_{\parallel} = 10^{o}$, instead of the major axis divergence. This results in a minor axis diameter, $\varnothing_{\parallel}$ = 1.1 mm. Comparing $\varnothing_{\perp}$ and $\varnothing_{\parallel}$, we see that a 3X magnification is necessary in the minor beam axis. This 3X magnification can be acheived using the PS879-B Mounted Anamorphic Prism Pair.

Lens Tube Mounting

For **mounted aspheric lenses**, our SM05Txx or S1TMxx adapters can be used. Take care to ensure that the lens does not contact the laser diode. The SM05Txx adapters will require the use of an SM1A6T SM1-to-SM05 adapter.

Unmounted aspheres can be epoxied to an LMRAxx adapter, which can then be mounted in an SM1A6T SM1-to-SM05 adapter. The SM1 threading of the adapter can then be used to attach the lens/mount/adapter to the laser diode mount's front plate. The SM1A6T adapter has a mounting range of 10 mm, covering almost the entire focal length range of our aspheric lenses.

In the above example, the C170TME-B mounted lens features M8 x 0.5 threading, thus requiring the S05TM08-threaded adapter. The S05TM08 M8-to-SM05 adapter can be mounted in the laser diode mount using the SM1A6T SM- to-SM05 adapter. The correct distance between the laser diode and lens can be acheived by adjusting both the S05TM08 and the SM1A6T adapters.

If the 352170-B, unmounted ashperic lens is used, it must first be epoxied to the LMRA8 adapter. It can then be mounted in the SM1A6T SM1-to-SM05 adapter. Again, adjustment of the aspheric lens can be made at the LMRA8 and SM1A6T adapters.

Cage Assembly Mounting

Mounted and unmounted aspheric lenses with focal lengths greater than 8 mm can be cage mounted using our 30 mm cage system. Cage rods can be attached directly to the front plate of the laser diode mount. The CP02 SM1 mount may be used to hold the S1TMxx adapter with mounted aspheric lens or the SM1A6T adapter with unmounted aspheric lens epoxied to an LMRAxx adapter.

For fine adjustment of the aspheric lens, the SM1Z can be used in lieu of the CP02 cage mount. The SM1Z translator allows 1.5 mm of travel and 1 µm incremental movement. For larger translational adjustments, the CT1 1/2" Travel Translator can be used.

Anamorphic Prism Pair Mounting

The astigmatic output of the laser diode can be corrected using either anamorphic prisms or cylindrical lenses. As determined in the example above, a 3X mounted anamorphic prism pair (i.e.,PS879-B) was needed to produce a round beam profile. Unmounted prisms may be used as well.

The PS879-B Mounted Anamorphic Prism Pair features SM05 threading on the output end or may be mounted inside an SM1 Lens tube. Since the input and output beams from the Anamorphic Prism Pair are offset from each other, prisms should be mounted on another cage or lens tube axis.

Hide Temperature Controlled Laser Diode Mount for Ø5.6 and Ø9 mm Lasers

Temperature Controlled Laser Diode Mount for Ø5.6 and Ø9 mm Lasers

Thorlabs' TCLDM9 Temperature Controlled Laser Diode Mount can provide both current regulation and temperature control for our Ø5.6 mm and Ø9 mm 3 or 4-pin TO Can laser diodes. The precise diode temperature control is facilitated through an integrated TEC element. Since this mount can control the laser diode while monitoring the photodiode independently, it is compatible with a wide variety of pin styles. It is directly compatible with A, B, C, D, E, and H pin configurations and can support the G configuration with some modifications (see the *Pin Configurations* tab for details).

This mount is compatible with a wide variety of laser diode controllers ranging from low power (low current and low voltage) to high power (high current and/or voltage) versions as well as TEC controllers. The TED200C benchtop temperature controller is ideally suited to regulate the temperature of a laser diode mounted in the TCLDM9. This unit features a wide operating temperature range, 12 W of cooling, and high temperature stability. For more cooling power and even higher temperature stability, the TED4015 225 W temperature controller can be used. Laser diode current controllers should be chosen based on the actual laser diode used and the particular application (see *Electronic Control* tab for more information).

Thorlabs also offers several dual laser diode current/temperature controllers and kits.

Part Number	Description	Price	Availability
TCLDM9	**TE-Cooled Mount for Ø5.6 mm and Ø9 mm Lasers**	**$491.00**	**Today**

Hide Mounting Flange for DPSS Lasers

Mounting Flange for DPSS Lasers

The TCLDM9DJ mounting flange is used to secure a 532 nm DPSS laser to the TCLDM9 laser diode temperature controlled mount. To use, remove the face plate of the TCLDM9 by removing the four corner-located 2-56 screws using a 5/64" hex driver. Remove the flange, either the one that comes already installed in the mount or one that has been installed later, by removing the two 2-56 x 3/8" cap screws and firmly pulling the flange out. Mount either the DJ532-10 or the DJ532-40 laser. Using the two 2-56 x 3/8" cap head screws provided with the flange, or with the mount itself, attach the flange to the mount. Replace the face plate, and the mount is ready for use (see photo to the right).

Please note: this flange is sold separately from the TCLDM9 Temperature Controlled Laser Diode Mount.

Click to Enlarge
TCLDM9 with DPSS Laser and TCLDM9DJ Mounting Flange

Part Number	Description	Price	Availability
TCLDM9DJ	**Customer Inspired!DPSS Laser Mounting Flange for TCLDM9 Laser Diode Mount**	**$20.40**	**Today**