

445nm Laser Diode Component, 5.6mm

This multi transverse mode laser diode component is pressed fit mounted in an aluminum housing and has an aluminum mountable heat-sink. The laser is set in the heat sink with thermally conductive paste. The front of the component contains a adjustable glass focusing lens for the laser output. The laser has an ABSOLUTE MAXIMUM of 1.7W and should only be run at this level for very short times. Additional cooling techniques would be advisable if you want to run for extended periods at this high power. 1 amp at 1W will allow for longer “on” times and will not degrade the laser as quickly. Thermal issues are the number one reason for catastrophic failure of the laser. while the mounting case provides heat sinking capability for the laser diode, it is up to the consumer to make sure the laser is operating effectively within these limits.

Absolute Maximum Ratings:

Item	Absolute Maximum Ratings	Unit
Forward Current (Tc = 25 °C)	1.7	A
Allowable Reverse Current (Tc = 25°C)	85	mA
Operating Case Temperature	50	°C

Electrical / Optical Characteristics

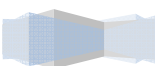
Item	Min	Typ.	Max	Unit
Typical Optical Output Power @1 amp		1		W
Typical Operating Current		1	1.7	A
Dominant Wavelength	435		455	nm
Threshold Current	80		220	mA
Operating Voltage	3.7		5.5	V
Focused Spot Size	.006	0.008		Inch
Beam Divergence Full Anlge (1/e ²) //	5	14	25	deg.
Beam Divergence Full Anlge (1/e ²) - Perp	30	44	50	deg.

-Above specifications are for reference purposes only and are subject to change. Figures in specifications may contain measurement errors.

Output Conditions

The laser diode output will vary depending on the temperature. While there is a housing and a small heat sink, it is recommended that the diode not be on for long periods of time. The laser diode will also require more current to maintain the same amount of output power as the diode degrades.

Normal operating conditions:



The laser diode will operate at its optimal level for thermal performance at 1 amp and an output of 1W. Additional current above this level will lead to possible degradation of the laser output and thermal damage if additional precautions for thermal management are not taken.

Static Precautions

Take precaution when handling laser diodes as they are a static sensitive devices. Static electricity and electrical surges will degrade the performance of the laser diode.

Laser Safety

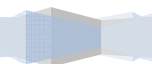


Laser light can cause damage to eyesight and skin if proper laser safety is not used. Always wear the appropriate laser goggles to prevent any laser light, either directly or indirectly to contact the eye. Never expose skin directly to laser radiation. Focused light will increase the safety hazard.

Laser Connection



If your laser was part of a driver kit, it will be cabled with a Molex mini fit Jr connector which will connect directly to the laser driver board output.



Diagram



Connection:

- Connect the laser to the Molex Mini Fit Jr. Header "H3" for laser output.

If you want to connect the laser to another power supply, you can cut the connector off and:

- Connect the laser positive (Red Wire) to the positive output of the laser driver.
- Connect the laser ground (Black Wire) to the negative output of the laser driver.

Cleaning the Lens:

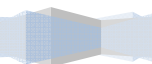
Sometimes soot or smoke can get onto the lens surface when processing, causing decreased levels in output power. Only clean the lens with approved lens wipes or a microfiber cloth. It is suitable to also use alcohol on the wipes or cloth when cleaning.

Focusing Your Laser

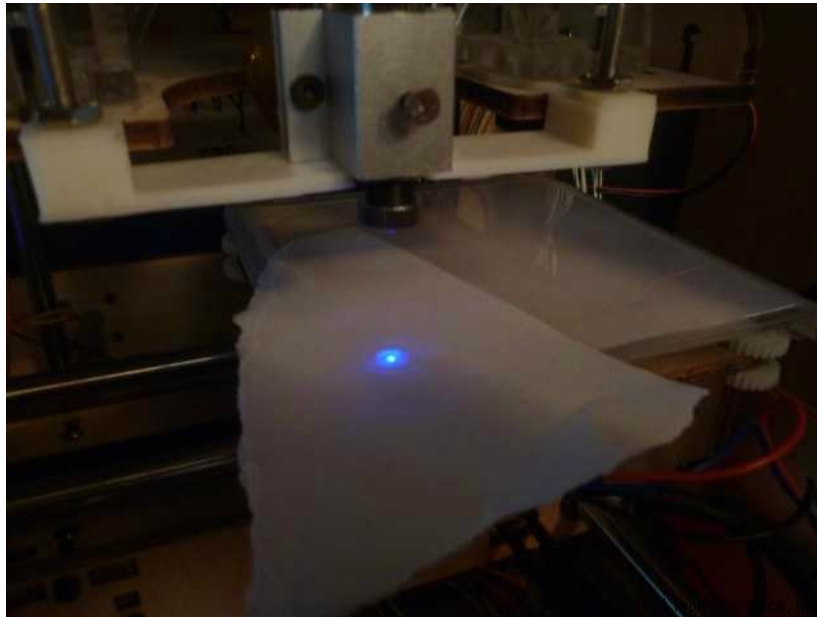
The laser module has an adjustable lens at the output aperture. Turn clockwise to adjust the lens into the housing and counter clockwise to adjust it out.

Here is a quick method for finding the minimum spot size focal length. Remember to use your safety goggles when performing this exercise.

1. Adjust the laser driver to under 500ma, preferably 200ma so you don't burn the surface while performing this procedure.
2. Set the machine Z height to about 2-3 inches above the work surface.
3. Place a white sheet of paper on the work surface. Tape it down if needed to keep it flat.
4. Set the power of the laser driver using the potentiometer to almost zero (just above the threshold for lasing).



5. Using your fingers, hand adjust the lens to get a small spot on the sheet of paper.
6. Now use the machine software to adjust the z axis up and then down in small increments to get the smallest spot possible. Adjust up until you see the spot get big, then adjust down until you see the spot get small then big again. The smallest spot size will be right in the middle of these amounts.
7. Set the Z height as zero in your machine and you now have your focal point set. To cut thicker materials, place the paper on top of the material to be cut and repeat, or simply adjust the z height in your machine to match the thickness of the material (i.e., if you want to cut 1/16" balsa then adjust the z height up 1/16").



Adjusting the focus and checking with a piece of paper.

Disclaimer

By purchasing this component laser diode you are agreeing to the following.

- You are over 18 years of age .
- You understand that these components that are mentioned above are dangerous when not properly assembled into a finished product.
- You will use these as components and properly incorporate them into a finished product.
- You will use these diodes/modules in a safe and responsible manner and for a legal purpose.
- You are legally responsible for the use of these components, improper use of these components or their end products.
- You are legally responsible for any injury to anybody resulting from the use of or assembly of these components or their finished products.
- You Accept this diode/module as a COMPONENT for integration in a system of YOUR OWN design and will be legally responsible from any and all LIABILITIES. These Diodes and Modules are sold solely as a component for incorporation into the customer's end products. Therefore, this diode/module is exempt from compliance with the appropriate requirements of FDA 21CFR, section 1040.10 and 1040.11 for complete products.

