

7W PRO 445nm Laser Head

This multi-mode laser diode component is pressed fit mounted in a copper housing and an extruded aluminum heatsink with attached fan and shroud. The magnetic shroud allows for easy mounting of the laser head to multiple platforms and also provides a safety viewing window for the laser processing. The front of the laser contains an adjustable glass focusing lens for the laser output. MFG setting of 3 amps will give approximately 7W or more of output power with the high resolution lens option calculated for power density. Average power at 3amps will be in the 6W range and give a long lifetime of 5,000 to 10,000 hours. Maximum current of 3.5amps will give 7W average power on the laser diode at a reduction of lifetime to 1,000 to 5,000 hours. Over 3.5amps is not recommended as the lifetime will decrease significantly.

Absolute Maximum Ratings:

Item	Absolute Maximum Ratings	Unit
Forward Current (Tc = 25°C)	3.5	A
Absolute Max Output Power	>7	W
Allowable Reverse Current (Tc = 25°C)	85	mA
Lifetime @3 amps	5000-1000	Hours
Lifetime @3.5 amps	1000-5000	Hours
Lifetime @4 amps	<1000	Hours
Operating Case Temperature	50	°C

Electrical / Optical Characteristics

Item	Min	Typ.	Max	Unit
Typical Optical Output Power @3 amps		5.3	6	W
Typical Optical Output Power @3.5 amps		6.5	7	W
Typical Optical Output Power @4 amps		7	7.3	W
Typical Operating Current		3		A
Dominant Wavelength	435	445	455	nm
Threshold Current	80		220	mA
Operating Voltage	3.7		5.5	V
Focused Spot Size	.0035	0.06		Inch
Beam Divergence Full Angle (1/e ²) //	5	14	25	deg.
Beam Divergence Full Angle (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.



Beam Profile

The new 7W Pro laser uses proprietary technology inside the laser diode package to decrease the total beam size while increasing the total power. Coupled with the high resolution lens, it is the smallest beam size possible with any diode laser.

The energy from the sides of the rectangle are superimposed into the center, increasing the power density, reducing the spot size, and making the beam uniform.



Spot size on wood typical is about 0.006" or less. On Acrylic, it is 0.0045". On tile it is 0.0035".

Output Conditions

The laser diode output will vary depending on the temperature. Warmer temperature environments will reduce the power of the laser. Do not have the laser in under 0 degrees C. 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 3 amps. 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. It is possible to reduce the current on the diode to increase the lifetime of the laser. Running at higher current levels reduce the lifetime of the laser.

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 Parts



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.

Connection:

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

Cleaning the Lens:

Sometimes soot or smoke can get onto the lens surface when processing, causing decreased levels in output power. This is especially needed for cutting projects. If your lens is dirty, then it will significantly reduce the power level.

To clean it, use a q tip and isopropyl alcohol. Dip the q tip in alcohol and then put it up into the lens holder and give it a twist or two to remove any debris. Take the q tip out and let it dry for 5 minutes before use.

Focusing Your Laser

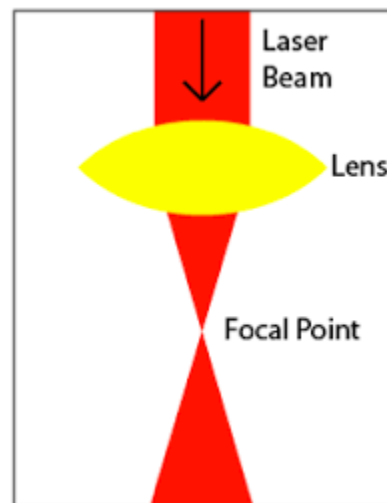
Your laser head comes pre-focused to 1/8" below the laser shroud. You can use the provided focusing tool to find the correct distance below the laser. Just simply move the laser head down until it just hits the tool and focus is set.

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. When we discuss the word "spot", it is actually a very small rectangle that the laser is producing if you have the 2.8W or 4.2W laser. The 7W PRO has a square beam profile.

Remember to use laser shielding if possible and your safety goggles when performing this exercise.

For details on focusing, visit the following web page here:

<https://jtechphotonics.com/?p=2602>



Mounting

The laser has several magnetic mounting kits available. Check the product website under the magnetic mounting kit section to see one for your machine or use the generic magnet mount.

The magnet mount makes it easy to remove the laser when using the router to carve. Simply disconnect the wires from the gantry connections and remove the laser from the mount. When you want to use the laser, then re-connect the wires and place the laser on the mount.



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.

