MAIN FEATURES

- **Mode-hop-free**
- **Single longitudinal mode**
- **Long coherent length: >15 meters**
- **Circular beam available**
- **High wavelength stability**
- **Extremely low noise**
- **Small size and low cost**
- **CDRH compliant: key switch and emission indicator**

MAIN APPLICATIONS

- **Holography**
- **Interferometry**
- **Metrology**
- **Spectroscopy**
- **Laser gauging**

INTRODUCTION

Our laser module, ATMF102, generates a collimated laser beam of single mode, long coherent length, mode-hop-free, good beam shape, and low noise. Among all the lasers available in the market, our laser offers the lowest noise and longest coherent length.

The outstanding specifications are achieved by using sophisticated and high performance electronics, plus well designed optics and mechanics. Both the laser current and the temperature are under tight control.

Unlike some other laser modules, we do not use any fan, nor other vibration parts in our lasers, making it quiet and vibration free.

It comes with a key switch and emission indications. In addition, there is also an indicator for temperature locking status.

It comes with a compact AC/DC adapter type power supply, which takes any AC main voltage: 85VAC to 245VAC.

LASER BEAM OPTIONS

The output beam have these options: bare, elliptic and circular beams.

The ATMF102 is composed of 4 detachable components: laser body, collimation lens, lens holder, and circularizer.

A. Bare Beam

When needing a bare laser beam, use only the laser body, see Figure 1. Although, the lens holder and collimation lens always come with the laser, they can be detached easily from the laser body.

B. Collimated Laser Beam

When needing a collimated laser beam, use the laser body, the lens holder, and the collimation lens which can be turned for adjusting the focus, see Figure 2A. Under this configuration, an elliptic laser beam is obtained by using a regular laser diode.

C. Collimated Circular Laser Beam By Using Special Laser Diode

It is an option to obtain a circular laser beam by using special laser diode which has a lens inside the laser diode body, see Figure 2B. The special laser diodes generating the circular beam have fewer choices than the regular laser diodes. Therefore, some wavelengths and/or powers are not available.

D. Collimated Circular Laser Beam By Using Anamorphic Prism Pair

Another way to generate the circular beam is by using an pair of anamorphic prism. We use this pair to form a beam circularizer and, according to the specific laser diode, we tune the positions and the angles of these prisms so that the output beam will become circular at far field. Therefore, this becomes another option for generating the collimated and circularized beam, to use all the 4 components: the laser body, the lens holder, the collimation lens and the circularizer, see Figure 3.

The main advantages of this approach are: unchanged phase wave-front plane, better controlled laser beam profile, and more options in selecting the laser diodes to be used in the laser module.

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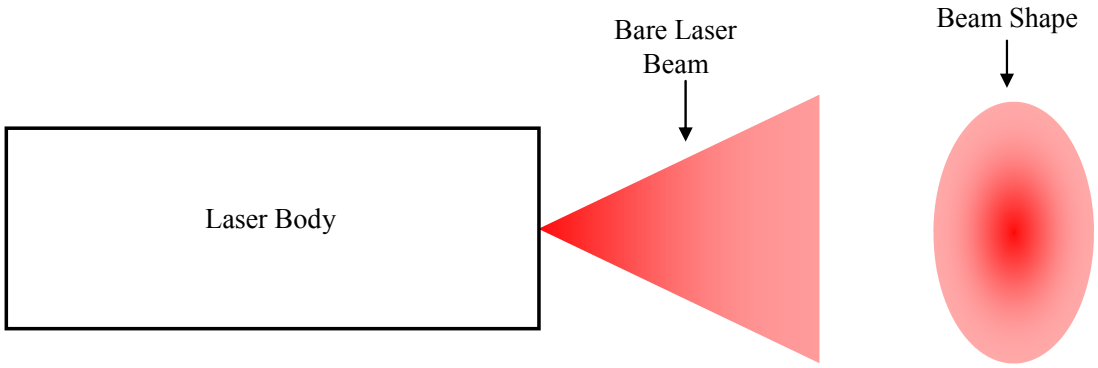

Figure 1 Generating a Bare Laser Beam

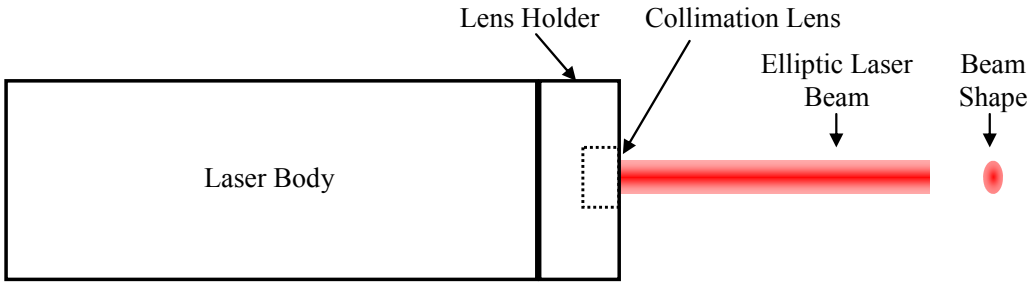

Figure 2A Generating an Elliptic Laser Beam

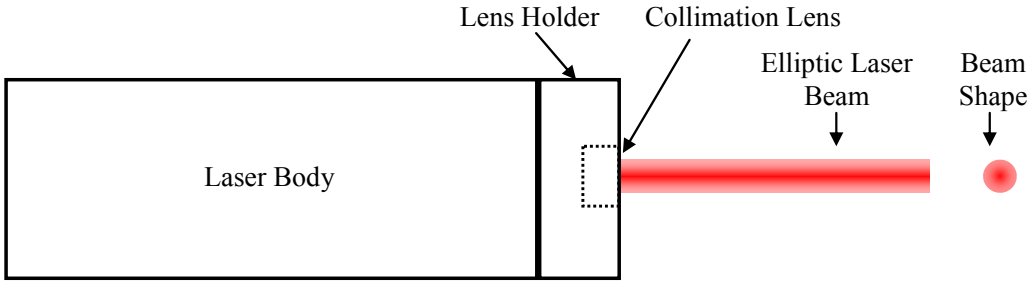

Figure 2B Generating a Circular Laser Beam by Using a Special Laser Diode

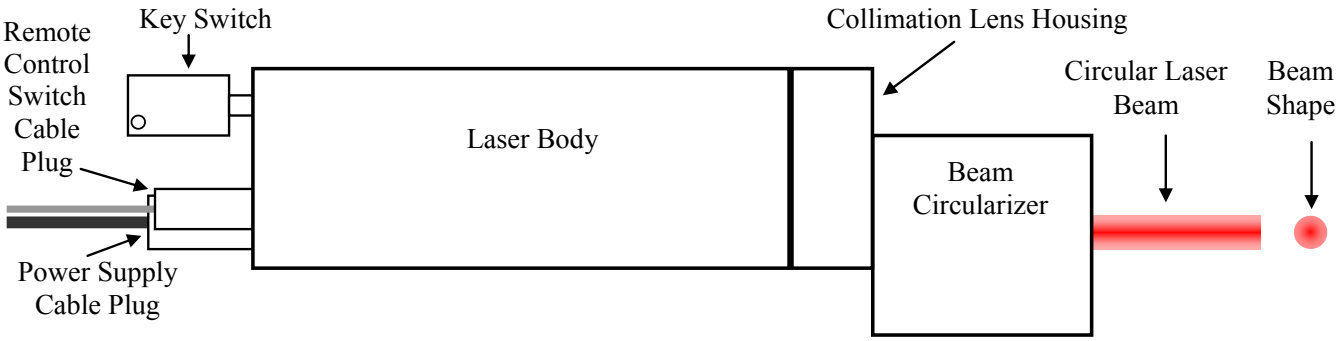

Figure 3 Generating a Circular Laser Beam

Please notice that the beam obtained from the beam circularizer will be of circular at far field (>3 meters).

Specifications

Parameter Name	Values	Note
Wavelength selection range*	635nm to 690nm	
Absolute wavelength accuracy	< ±0.1nm	
Output power	1mW to 100mW	
Output power stability	< ±0.1% within 24 hours	
Optical output noise (10Hz to 2MHz)	< 0.01% (RMS)	
Spectrum line-width	< 20MHz (27×10^{-14}m)	
Beam divergence	1 mrad (typical)	Both elliptic and circular beams
Elliptic Beam size	1.5mm × 4.5mm (typical)	Collimated elliptic beam
Circular Beam size	ϕ5mm (typical, at far field)	Collimated circular beam
Polarization	> 100:1	
DC power supply voltage required:	5V ± 5%	
DC power supply current drawn	0.1A to 0.6A	
AC input voltage for the power supply adaptor	80V – 245V, 47Hz to 63Hz	
AC input power for the power supply adaptor	< 5W	
Ambient operating temperature	0°C to 40°C	
Environmental relative humidity	< 80%	
Overall dimensions:	See the drawings in Figure 4 to 6	

*Wavelength depends on the laser diode used. The laser diode, the output wavelength and output power can be specified when ordering.

ORDERING INFORMATION

Part Number	Description	Price			
		1 to 4	5 to 9	10 to 24	≥ 25
ATMF102A	Using regular laser diode to generate an elliptic beam	$820 + laser diode price*	10% discount	15% discount	25% discount
ATMF102B	Using anamorphic prism pair to generate a circular beam	$820 + $150 + laser diode price	10% discount	15% discount	25% discount
ATMF102C	Using special circularized laser diode to generate a circular beam	$820 + laser diode price	10% discount	15% discount	25% discount

*Laser diode price changes from time to time. These are the ballpark price figures:

A. $200 for 638nm 30mW regular laser diode.

B. $150 for 660nm 50mW regular laser diode.

C. $300 for 638nm 30mW special circularized laser diode.

D. $250 for 660nm 50mW special circularized laser diode.

For other laser diode prices, please contact us or check it on the internet from which you will learn a ballpark price.

OPERATING THE LASER

1. **Safety first.** Mount the laser properly so that the laser beam will not point to any person's eyes. Please check appropriate local regulations and observe them properly.
2. Insert the control switch key into the keyhole and keep it in the OFF position.
3. Check the AC main voltage by someway and make sure that it is within the voltage required by the power supply. If yes, plug the power supply input terminals into the AC main and insert the output plug into the socket for the power supply on the back of the laser, see Figure 4.
4. Insert the interlock switch cable plug into the interlock switch socket, see Figure 4. This cable can be connected to a mechanical switch if the laser needs to be controlled remotely, to an electronic switch if the laser needs to be controlled by an electronic circuit, the digital I/O port of a computer if the laser needs to be controlled by software, or simply short circuit the cable if choosing not to control the laser by this switch.
5. Turn the control switch to the AL (stands for Alignment) position for aligning optical components with this laser. At this position, the laser will emit weak laser beam, which will not be too bright for naked eyes to do the alignment work.
6. To turn on the laser:
   A. Rotate the control key switch to the ON position, which turns on the TEC (ThermoElectric Cooler) control circuits, and wait for a few seconds till the TEC LED comes on. Now, the laser is brought into the right temperature for working.
   B. Turn the control key switch to the LD position and the laser is now turn on to its full power.
   C. Wait from a few seconds to 1 minute, the laser will emit single mode beam with long coherent length.
7. To turn off the laser: rotate the control key switch to the OFF position.
8. The CL (stands for calibration) position for the control key switch is for calibration usage, this function is not needed for ATMF102 laser modules, therefore, the AL position is not utilized.
9. These are the "Do not Do's":
   A. Do not turn on and/or off the laser by inserting the power supply plug into the socket.
   B. Do not turn on and/or off the laser by the input AC voltage to the power supply.
   C. Do not turn on the laser before the TEC LED is not lit.
   D. Do not place the first optical component too close to the laser and try to minimize any back reflections, otherwise, the laser beam may lose its important and valuable features: single mode, mode-hop-free, and/or having long coherent length.

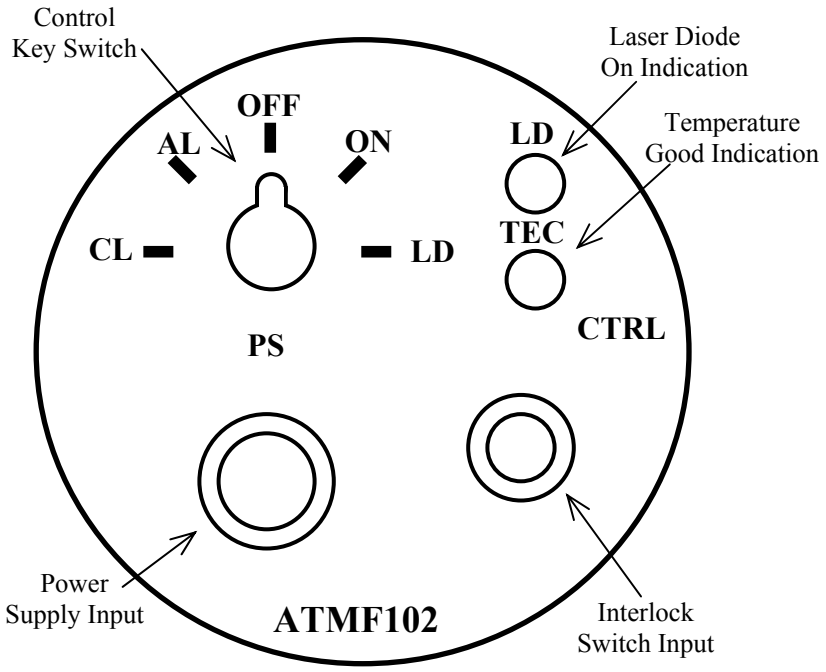

Figure 4 Back View of the Laser

MECHANICAL DIMENSIONS

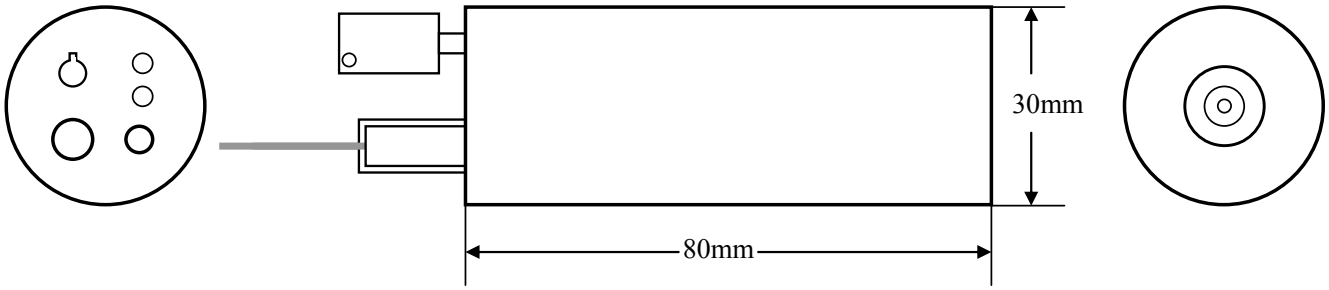

Figure 5 Laser Body

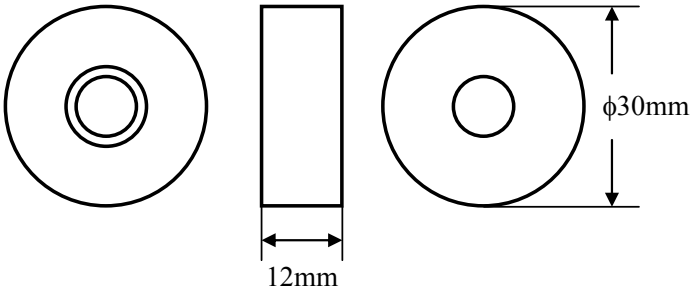

Figure 6 Collimation Lens

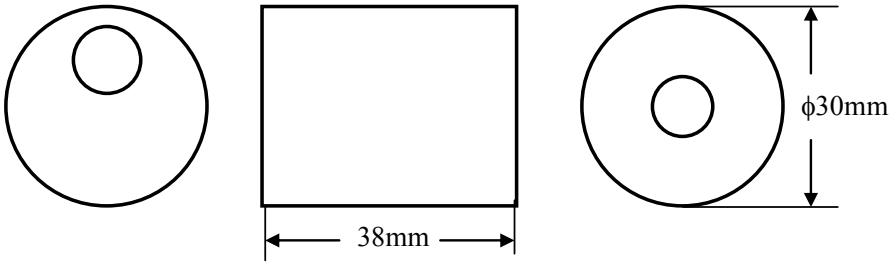

Figure 7 Beam Circularizer

Contact us for more information and if there are any questions:

1. By E-mail: gang.liu@analogtechnologies.com
2. By phone: 408-747-9760