

980nm High Power Fiber Coupled Laser Diode Module

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1. Introduction

980 series high power fiber coupled laser diode module with optimized QW structure have a high reliability, high performance. The 980nm series high power fiber coupled Laser Diode module can get up to 25W multimode fiber coupled output. It can be applied in a wide field such as laser pumps, medical, target designator, free-space communication.

2. Requirements

2.1. The requirements on the power supply driving the LD

Constant-current should be available for power supply. The power supply should have the ability to avoid current or voltage surge at any condition (during start-up, intermittence or open circuit). The surge would result in instant increase of optical power, which can cause COMD (catastrophic optical mirror damage).

High power Laser Diodes could operate in forward voltage.

2.2. Laser operating requirements

- Please check the laser safeguard before used the LD.
- Laser usage requirements in environment A ultra-clean environment should be provided for operating the LD.
- Laser safety warning signs should be posted in the working place.
- The laser can be connected to UPS power or connected to city power using a stabilizer.
- The semiconductor Laser Diode is a sensitive electronic device. Do not ship or store near strong electrostatic, electromagnetic, magnetic or radioactive fields.
- Please observe precaution for handling electrostatic sensitive devices, such as wearing antistatic wrist straps, use anti-static packaging material and tools when operation.
- Shut off the power supplier before connecting the LD with the power supplier. To shut off the LD please decrease the current to zero gradually then shut off the power supply.

- The operating current of laser must not be higher than the given rate current. The excessive current would accelerate aging and shorten lifetime, even damage the LD.
- Keep the fiber pigtail as shown in Fig. 1, clean. Do not touch the tip of the fiber with your hand or anything. To utilization the laser, the fiber lid must be separated, and after turning off the laser, you must put the fiber lid protector on. any contamination of the fiber tip and even dust can cause serious damage to the laser. In non-working environment, you must use the protection case to avoid fiber pigtail from being polluted. If you need to clean the fiber pigtail, use ethanol or water-free alcohol cotton balls and wipe fiber pigtail gently.



Fig. 1. Fiber pigtail laser image

- When laser is working, please don't point it straight to the fiber, in order to prevent the fiber protection case from being damaged by high-power laser generated heat. Also, make sure that the fiber lid is not set in front of the reflective

surfaces with a short distance, in this case, the laser light will be returned to the fiber and lead to damage to the laser diode.

- Strictly, avoid folding the optical fiber and in order to steady the device in the box, you must wrap the optical fiber with a large radius and then steady it in the box and make sure that the optical fiber is not under pressure.
- As shown in Fig. 2, bending diameter of the fiber cannot be allowed to be less than 4cm. When bending the fiber, please make sure the starting point is away larger than 4cm from the fiber root. When moving the laser, please don't directly use fiber. Not obeying these rules may cause fracture of the laser fiber from the root.

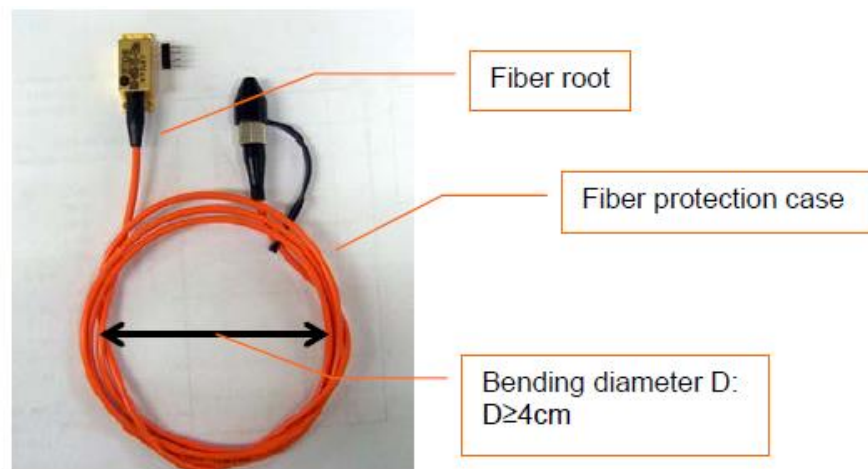


Fig. 2. Fiber laser image

- Make sure that the module and the fiber as shown in Fig. 3, are in the same plane.

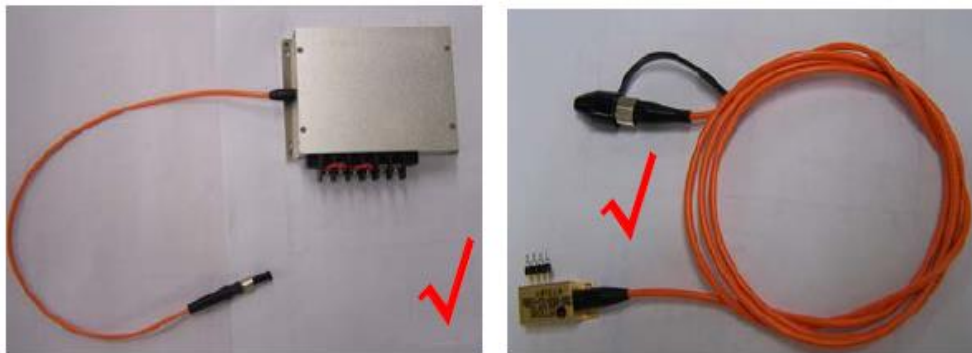


Fig. 3. The correct way to put module and fiber

- Try not to use the maximum power of the laser for a long time so that the useful life of the device does not decrease.
- If the device is not in use, it should be stored in its box at ambient temperature and in a dry place away from chemicals materials.

2.3. Cooling system

High-power semiconductor Laser Diodes are temperature-sensitive devices. High temperature will affect its performance. Its lifetime may also be shortened by working at high temperature. So the generated heat must be removed in time when the LD is working. Water cooling system or TEC system is recommended for keeping the LD working at appropriate temperature.



2.4. Laser safety instructions

High power laser diodes are high energy laser devices. It is harmful to human body and health. Any personnel working with or around open lasers must be aware of the following:

- Laser light can be harmful to human eyes and skin. Exposure to the laser beam may cause physical burns and can cause severe eye damage. Never look directly into the laser output port. All eye protection should be appropriate for the radiation wavelength generated by the laser in use. You should be used Proper eye protection NIR light blocking glasses at all times.
- Exposure to the laser beam may cause ignition of volatile or combustible materials.
- Interlock all rooms in which open beams may be present and post appropriate warnings on or near the doors. Access to these rooms should be limited to properly trained technicians when lasers are in use.
- Use appropriate protective coverings over all beam paths whenever possible.
- Lasers and optical elements should be positioned to keep the beam and reflections below eye level.

3. How to use the 980nm high power fiber coupled laser diod module

The laser can be connected to UPS power or connected to city power using a stabilizer. Figures 4 and 5 show the front and back views of the 980nm laser device . To turn on the laser, you must first connect the power cable to the device through the stabilizer and set the button on the back of the device to one or on, which will turn on the device's fan and the device's screen. As shown in Fig. 4, when the display screen is turned on, the current, voltage and temperature of the laser can be seen. The temperature of the laser is set at 22°C, and by changing this temperature, you should turn off the laser to avoid damaging the device. Open the fiber lid protector gently. To turn on the laser, Press the laser on and off button and to increase the laser power, increase the current with turn the power adjustment screw.



Fig. 4. Front view of the 980nm laser device



Fig. 5. Back view of the 980nm laser device

Laser power can be alternated by alteration the current. The power increase screw is locked on the maximum laser power and it is not possible to increase the current further. The maximum laser power is 1 watt. You can use an IR Card to view the laser light and adjust its location. How to place the laser depends on the intended application.

The important point is that the tip of the fiber should not be in direct contact with the sample in any way, otherwise the laser can be irradiated to the sample at any angle depending on the type of application. If spectroscopic application is considered and the material has luminescence properties, the emission created by the material should be measured at an angle of 90 degrees to the laser radiation to the sample by means of a spectrometer coupled to an optical fiber.