



## HIGHLY STABLE LASER DIODE SOURCE

### Features:

- Wide range of available wavelengths: 400 nm to 2050 nm
- Long life time, excellent stability: <math><0.1\%</math> at 1550 nm
- High power versions available
- Polarization maintaining, singlemode or multimode fiber output available
- Wide range of connector receptacles available
- Optional output power adjustment via blocking screw

### Applications:

- Accurate fiber optic testing
- Insertion loss measurement
- Splicing and connectorization
- End to end short link testing
- Component manufacturing and testing



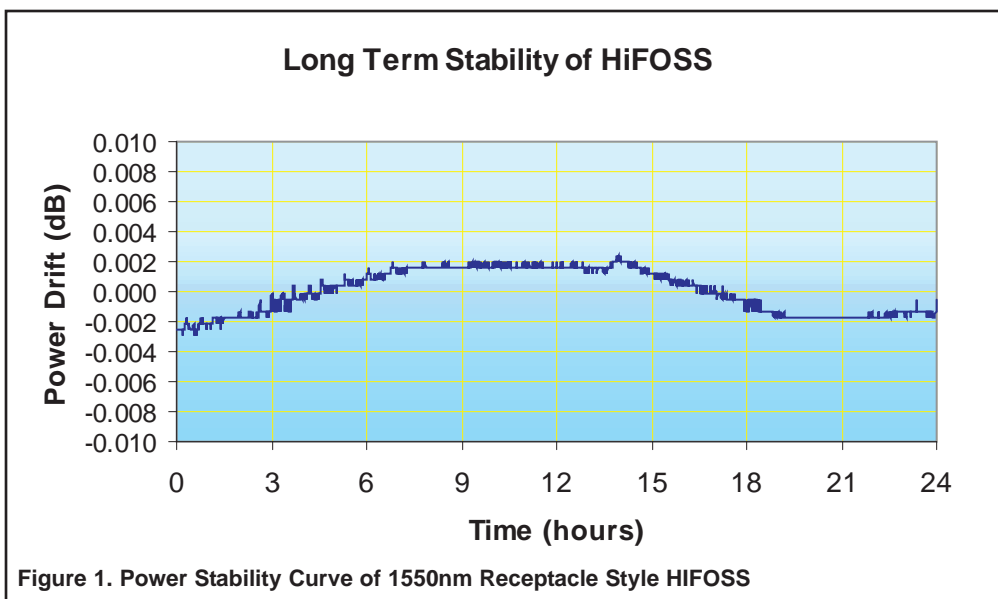
### Product Description:

OZ Optics produces the Highly Stable Laser Diode Sources (**HIFOSS**) in a variety of wavelengths. The **HIFOSS** has a built-in thermoelectric (TE) cooler to maintain the laser diode at a stable temperature and an isolator to reduce effects of backreflection. This substantially increases the stability of the source.

Both the receptacle-style source and pigtail-style source offer the choice of polarization maintaining, singlemode, or multimode fiber output, with a wide range of receptacles or connectors. OZ Optics recommends angled connectors for optimum stability.

In general, OZ Optics uses polarization maintaining fibers based on the PANDA fiber structure when building polarization maintaining components and patchcords. However OZ Optics can construct devices using other PM fiber structures. We do carry some alternative fiber types in stock, so please contact our sales department for availability. If necessary, we are willing to use customer supplied fibers to build devices.

As an option, OZ Optics can include a blocking-style optical attenuator, digitally driven or manually operated, to change the output power. This method of power control does not affect the spectral properties of the laser diode output. Please contact OZ Optics for details.



### Ordering Information For Standard Parts:

Bar Code	Part Number	Description
13608	HIFOSS-01-3S-9/125-1310-S-1	Highly Stable Laser Diode Source with 1310 nm wavelength, 1 mW output, TE cooler and isolator, for 9/125 core/cladding singlemode fiber, with FC/PC receptacle.
13609	HIFOSS-01-3S-9/125-1550-S-1	Highly Stable Laser Diode Source with 1550 nm wavelength, 1 mW output, TE cooler and isolator, for 9/125 core/cladding singlemode fiber, with FC/PC receptacle.
13610	HIFOSS-01-3S-9/125-1625-S-1	Highly Stable Laser Diode Source with 1625 nm wavelength, 1 mW output, TE cooler and isolator, for 9/125 core/cladding singlemode fiber, with FC/PC receptacle
2737	POWER CORD - EUROPE	Power cord for operation in Europe
2736	POWER CORD - UK	Power cord for operation in the United Kingdom

### Standard Product Specifications:

Parameter	Specifications	
Available wavelengths <sup>1</sup>	635, 650, 670, 685, 780, 810, 830, 850, 980, 1064, 1310, 1480, 1550, 1625 or 2050 nm	
Wavelength accuracy <sup>2</sup>	±20 nm (nominal)	
Linewidth <sup>3</sup>	1.5 nm (Typical for 1550nm)	
Optical power <sup>4</sup>	0.8 to 1 mW (standard)	
Optical Power Stability (Typical) <sup>5</sup>	±0.004 dB	
Available receptacles	Super FC/PC, FC/APC, SC, Angled SC, AT&T-ST, LC and MU	
Power supply <sup>6</sup>	110/220 V AC 60/50 Hz	
Dimensions(W x L x H) <sup>7</sup>	260 x 209 x 90 mm	
Temperature range	Operating	0 to +50 °C
	Storage	-40 to +70°C

**Note:**

<sup>1</sup> Typical wavelengths shown. For other wavelengths, please contact OZ Optics.

<sup>2</sup> Depends on laser diode specification.

<sup>3</sup> For narrow linewidths, please contact OZ Optics

<sup>4</sup> Higher powers are available on request. Please contact OZ Optics for further information

<sup>5</sup> Tested at 1550 nm wavelength, with FC/APC receptacle, 9/125 singlemode fiber, at 23°C, after 30 minutes warm up.

<sup>6</sup> North American power cord supplied as standard. For Europe and the UK, please refer to the standard parts list for other power cords.

<sup>7</sup> Dimension and weight may change with wavelength and options

### Ordering Examples For Standard Parts:

A customer from the UK needs a 1550 nm laser diode source with TE cooler and isolator, with 1 mW output power for 9/125 µm core/cladding singlemode fiber, and a super FC/PC receptacle. He needs better than 0.01dB power stability from 0° to 40°C.

Bar Code	Part Number	Description
13609	HIFOSS-01-3S-9/125-1550-S-1	Highly Stable Laser Diode Source with 1550 nm wavelength, 1 mW output, TE Cooler and isolator, for 9/125 core/cladding singlemode fiber, with Super FC/PC receptacles.
2736	POWER CORD - UK	Power Cord for Operation in the UK.

## Ordering Information For Custom Parts:

OZ Optics welcomes the opportunity to provide custom designed products to meet your application needs. As with most manufacturers, customized products do take additional effort so please expect some differences in the pricing compared to our standard parts list. In particular, we will need additional time to prepare a comprehensive quotation, and lead times will be longer than normal. In most cases non-recurring engineering (NRE) charges will be necessary. These points will be carefully explained in your quotation, so you will be as well-informed as possible when making your decision. We strongly recommend buying our standard products.

## Questionnaire For Custom Parts:

1. What is the wavelength required for the laser diode source?
2. What is required maximum output power of the laser diode source?
3. What type of optical receptacle is required?
4. What size and type of fiber are you using?
5. What level of stability is required?
6. What will be the ambient operating temperature?

### Receptacle Style HIFOSS:

**HIFOSS-01-X-a/b-W- F-P(-BL)<sup>1</sup>**

**X** = Receptacle or connector codes:<sup>2</sup>

3S = Super or Ultra NTT-FC/PC receptacle  
 3A = Angled NTT- FC/PC  
 SC = SC  
 SCA = Angled SC  
 8 = AT&T-ST  
 LC=LC  
 MU=MU

**P** = Output Power, in mW (1mW standard)

**F** = Fiber type:

M = Multimode  
 S = Singlemode  
 P = Polarization Maintaining

**W** = Wavelength in nm: 635, 650, 670, 685, 780, 810, 830, 850, 980, 1064, 1310, 1480, 1550, 1625, 2050

**a/b<sup>2</sup>** = Fiber core/cladding size, in  $\mu\text{m}$   
 9/125 for 1300/1550 singlemode fiber  
 8/125 for 1550nm PM fiber  
 7/125 for 1300nm PM fiber

### Pigtail Style HIFOSS:

**HIFOSS-11-a/b-W-F-P-X-JD-L**

**a/b<sup>2</sup>** = Fiber core/cladding size, in  $\mu\text{m}$   
 9/125 for 1300/1550 singlemode fiber  
 8/125 for 1550nm PM fiber  
 7/125 for 1300nm PM fiber

**W** = Wavelength in nm: 635, 650, 670, 685, 780, 810, 830, 850, 980, 1064, 1310, 1480, 1550, 1625, 2050

**F** = Fiber type:

M = Multimode  
 S = Singlemode  
 P = Polarization Maintaining

**P** = Output Power, in mW (1mW standard)

**L** = Fiber length, in meters

**JD** = Fiber jacket type:

1 = 900  $\mu\text{m}$  OD Hytrel jacket  
 3 = 3 mm OD Kevlar-reinforced PVC cable

**X** = Receptacle or connector code:<sup>2</sup>

3S = Super or Ultra NTT-FC/PC receptacle  
 3A = Angled NTT- FC/PC  
 SC = SC  
 SCA = Angled SC  
 8 = AT&T-ST  
 LC=LC  
 MU=MU  
 X= No connector

### Notes:

<sup>1</sup> Add **-BL** to the part number to add blocking style attenuator to the HIFOSS.

<sup>2</sup> See the OZ Optics Standard Tables data sheet for fiber sizes, jacket sizes and other connectors

## Ordering Examples For Custom Parts:

A customer needs a 1310nm laser diode source, with TE Cooler, isolator and 5mW output power, for singlemode fiber with a super FC/PC receptacle. He wants the output power to be adjustable.

Bar Code	Part Number	Description
N/A	HIFOSS-01-3S-9/125-1310-S-5-BL	Highly Stable Laser Diode Source with 1310 nm wavelength, 5 mW output, TE cooler, isolator and blocking attenuator, for 9/125 core/cladding singlemode fiber, with Super FC/PC receptacles.

## Frequently Asked Questions (FAQs):

**Q:** Do you have a laser diode source that includes a TE cooler circuit?

**A:** Yes. Our Highly Stable Laser Diode Source (**HIFOSS**). Includes this as a standard equipment.

**Q:** Does the **HIFOSS** have a modulation function? What's the maximum frequency?

**A:** It is not a standard option on the **HIFOSS**, but may be built as a custom order. Contact OZ Optics for details.

**Q:** Does OZ design and manufacture sources using customer supplied laser diodes, or isolators?

**A:** Yes. Please provide OZ Optics with the detailed information.

**Q:** With a 1mW source, how much power can be coupled into a fiber?

**A:** Depends on the connection loss between receptacle and connector, which is typically not more than 1dB. So about 0.8mW of power will be coupled into a fiber.

**Q:** Can I use a patchcord with an FC/APC connector with a **HIFOSS** with an FC/PC receptacle?

**A:** Not without high losses. The angle polish of the FC/APC connector will not properly contact the fiber inside the **HIFOSS**.

**Q:** Do you offer 1.25mm and 2.5mm ID universal adaptors for your sources?

**A:** We can, but we do not recommend them. Universal adaptors do not have a retaining mechanism, so the fiber can fall out if you do not hold it in place. In addition, the lack of a retaining mechanism will cause the coupled power from the source to be unstable. Universal receptacles can be used in applications where you are not concerned with the power stability, such as visible sources for fault location, or PFOSS or HIFOSS polarized sources for PM fiber patchcords.

## Application Notes:

The OZ Optics Highly Stable Laser Diode Source (**HIFOSS**) has a built-in TE cooler circuit to maintain a stable temperature for the laser diode. The isolator prevents the backreflected light from the fiber following the optical path back to the laser diode. The **HIFOSS** offers excellent stability for accurate optical fiber testing and other applications. The device may be configured with one of many different wavelengths, adjustable output power, and the choice of many connector types. With these features, the **HIFOSS** is ideally suited for precision optical component and system measurement applications.

### Insertion loss, backreflection, and attenuation measurement

When used with an optical power meter, the **HIFOSS** laser source provides an alternative to loss and backreflection test sets, due to its excellent stability.

For singlemode applications, such as telecom or CATV environments, the **HIFOSS** can be coupled with an optical power meter to form a test kit that performs optical loss tests at 1310 or 1550 nm.

### Using a bare fiber with a source

A common application is to connect a fiber without any connector (bare fiber) to either another fiber or to a source or meter that contains a fiber stub. In these applications the best approach is to use an intermediate patchcord, with the appropriate connector on one end, and a bare fiber on the other end. The end with the connector is attached to the source or meter, and the bare fiber end is connected to the bare fiber on the device to be tested. Both fibers are first stripped, cleaned and cleaved and then spliced together. This can be done with a fusion splicer, or alternatively, a simple mechanical splice (OZ Bar Code #1933) can be used. To use the mechanical device, each cleaved fiber end is first dabbed into index matching gel (GEL-01, OZ Bar Code 2861) to act as a lubricant. One fiber end is inserted about half way into the splice, then the other fiber end is pushed in until it butts against the first fiber. Losses are typically less than 1dB, and the parts can be reused.

## Maintenance

To ensure the best performance of the **HIFOSS**, some simple maintenance is required.

### Cleaning the connector

A clean output connector ensures that good connections are made between the **HIFOSS** and the fiber under test. Failure to clean connectors can cause permanent damage to both the fiber end and the connector of the **HIFOSS**. Clean the connector before each use with a fresh lint-free tissue and alcohol.