



M530F1

Description

Thorlabs' M530F1 Fiber-Coupled High-Power LED has a nominal wavelength of 530 nm, outputs more than 4.0 mW of power, and is mounted to the end of a heat sink. The output is compatible with SMA fiber connectors. This LED needs to be supplied with a constant current that must not exceed 1000 mA. The current source must be able to deliver this current at a forward voltage of 3.6 V.

Specifications

Specification	Value
Color	Green
Nominal Wavelength	530 nm
Power LED Output (Min)*	4.0 mW
Power LED Output (Typical)*	5.1 mW
Test Current for Typical LED Power	1000 mA
Maximum Current (CW)	1000 mA
Forward Voltage	3.6 V
Bandwidth (FWHM)	33 nm
Typical Lifetime	>50,000 h

* For multimode fiber with a $\varnothing 400 \mu\text{m}$ core and 0.39 NA.

Operating Instructions

Be sure to provide air ventilation in order to avoid overheating, drops in optical power, and reduced lifetime. Each LED has a characteristic switch-on behavior, which depends on the LED properties and environment conditions. An important criterion is the heat dissipation. The M530F1 has a unique thermal design that reduces the power decay to a minimum.

The drawing to the right shows the M530F1 male connector, which is a standard M8 x 1 sensor circular connector. Pins 1 and 2 connect to the LED. Pins 3 and 4 are used for the internal EEPROM. Only use these connections when using a Thorlabs LED driver.

UV LEDs in conjunction with optical fibers exhibit a behavior which seems paradoxical at first glance: the high energy emission causes a change in the optical properties of the fiber, particularly the refraction index. This change will result in a slow decrease of insertion loss and improvement of coupling properties. Thus, the optical power will increase and reach a stable value 5 to 20 minutes after the LED is switched on, depending on the fiber type and wavelength. This process is reversible, although the relaxation can take hours. It can be forced by heating the fiber. Please pay attention to this behavior if your application is sensitive with respect to the power stability.

Optical Fiber

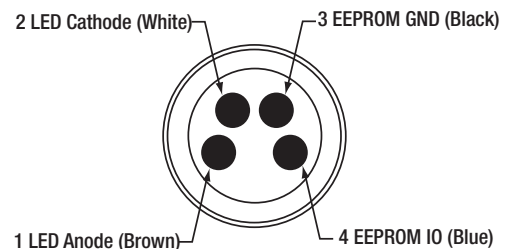
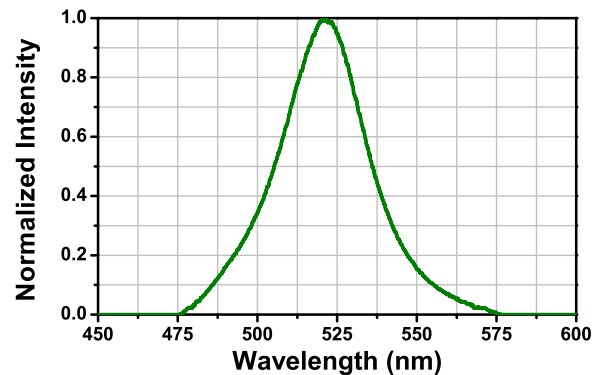
Fiber connection to the M530F1 must be made via an SMA fiber connector. We recommend using multimode (MMF) fiber with the M530F1. Optical output power is specified for a $\varnothing 400 \mu\text{m}$ MMF with an NA of 0.39 at the maximum allowed LED current. Optical power increases proportionally with the core diameter and nearly proportionally to the square of the NA.

Power Supply

We recommend using Thorlabs' DC2100 or LEDD1B LED current drivers (for control of a single LED). Alternatively, the DC4100 or DC4104 can be used with the DC4100-HUB, which allows simultaneous control of up to 4 individual LEDs.

If you decide to use your own DC source, please make sure that the operation current does not exceed the maximum allowed value, sufficient forward voltage is supplied, and that the correct connection is made to Pins 1 and 2.

M530F1 Spectrum



Maintenance and Service

Do not stick any items into the SMA connector aperture - you may damage the LED.

The M530F1 is not water resistant and must be protected from adverse weather conditions. To avoid damage, do not expose it to spray, liquids, or solvents. The M530F1 does not contain any parts serviceable by the user and does not require regular user maintenance. Do not open the enclosure. If a malfunction occurs, contact Thorlabs for return instructions.

If your fiber-coupled LED needs repair, please contact Thorlabs for return instructions.

Warnings and Safety

Optical power density out of the output connector or fiber tip may be hazardous to the human eye - do not look into the connector or fiber aperture.

Inappropriate use of any High Power LED product may result in permanent eye damage. To prevent injury, use this product in accordance with the International Standard "Photobiological Safety of Lamps & Lamp Systems" CEI IEC 62471.

If using this LED in a microscope application as a replacement for mercury vapor lamp, the same precautions should be taken.

During normal operations, the casing temperature may exceed ambient temperature by as much as 25 °C (45 °F). To prevent higher case temperatures, the products should be operated without anything hindering air movement around the convective cooling fans.

All statements regarding safety of operation and technical data only apply when the unit is operated correctly according to its specifications.

This LED must not be operated in explosive environments and should only be used with shielded connection cables.

Warranty

Thorlabs warrants material and production of the M530F1 for a period of 24 months starting with the date of shipment. During this warranty period Thorlabs will see to defaults by repair or by exchange if these are entitled to warranty.

For warranty repairs or service the unit must be sent back to Thorlabs. The customer will carry the shipping costs to Thorlabs, in case of warranty repairs Thorlabs will carry the shipping costs back to the customer.

If no warranty repair is applicable the customer also has to carry the costs for back shipment.

In case of shipment from outside EU duties, taxes etc. which should arise have to be carried by the customer.

Thorlabs warrants the hard- and software determined by Thorlabs for this unit to operate fault-free provided that they are handled according to our requirements. However, Thorlabs does not warrant a fault-free and uninterrupted operation of the unit, of the software or firmware for special applications nor this instruction manual to be error free. Thorlabs is not liable for consequential damages.

Restriction of Warranty

The warranty mentioned before does not cover errors and defects being the result of improper treatment, software or interface not supplied by us, modification, misuse or operation outside the defined ambient stated by us or unauthorized maintenance.

Further claims will not be consented to and will not be acknowledged. Thorlabs does explicitly not warrant the usability or the economical use for certain cases of application.

Thorlabs reserves the right to change this instruction manual or the technical data of the described unit at any time.

