Fiber-Coupled LED, 365 nm

M365FP1

Description

Thorlabs' M365FP1 Fiber-Coupled LED has a nominal wavelength of 365 nm, outputs more than 9.8 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 1400 mA. The current source must be able to deliver this current at a forward voltage of 3.75 V.

Specifications

Specification	Value
Color	UV
Nominal Wavelength	365 nm
Bandwidth (FWHM)	9 nm
Test Current for Typical LED Power	1400 mA
Maximum Current (CW)	1400 mA
Electrical Power	5250 mW
Emitter Size	1.4 mm x 1.4 mm
Typical Lifetime	>23 000 h
Operating Temperature (Non-Condensing)	0 to 40 °C
Storage Temperature	-40 to 70 °C
Risk Group[a]	RG2 - Moderate Risk Group

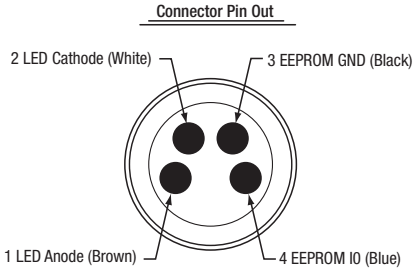
a. According to the standard IEC 62471:2006, Photobiological Safety of Lamps and Lamp Systems

M365FP1				
	Symbol	**Min**	**Typical**	**Max**
Peak Wavelength[a]	λ_p	360 nm	365 nm	370 nm
LED Output Power (Ø400 µm Fiber)[b,c]	P_{out}	9.8 mW	15.5 mW	-
LED Output Power (Ø200 µm Fiber)[b,d]	P_{out}	-	5.29 mW	-
Forward Voltage	V_F	-	3.75 V	-

a. When Driven with a Current of 1000 mA
b. When Driven with the Test Current
c. For multimode fiber with a Ø400 µm core and 0.39 NA (Item # FT400EMT).
d. For multimode fiber with a Ø200 µm core and 0.22 NA (Item # FG200UCC).

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 M365FP1 has a unique thermal design that reduces the power decay to a minimum.



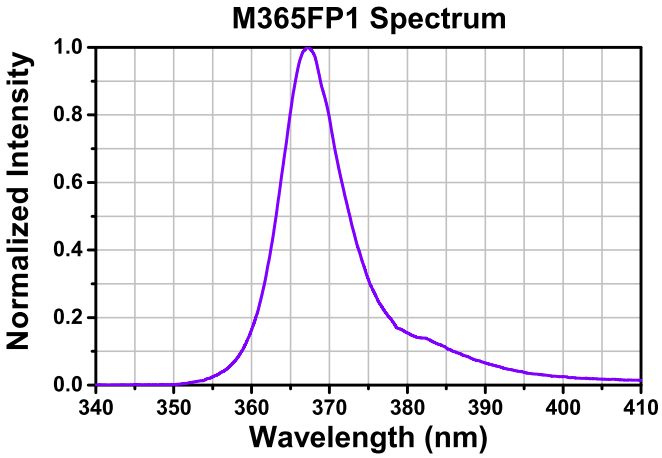
The drawing to the right shows the M365FP1 male connector, which is a standard M8 x 1 sensor circular connector. Pins 1 and 2 connect to the LED. Pins 3 and 4 are used for the internal EEPROM. Only use these connections when using a Thorlabs LED driver.

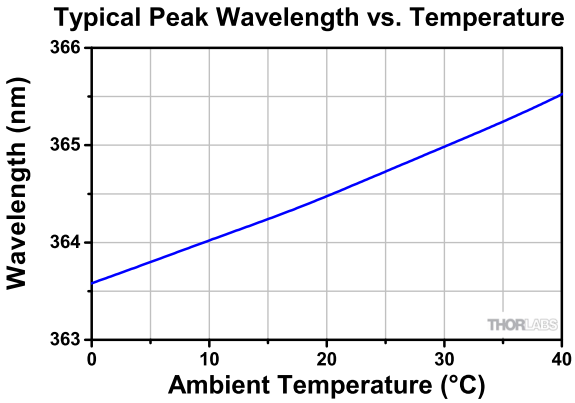
Optical Fiber

Fiber connection to the M365FP1 must be made via an SMA fiber connector. We recommend using multimode (MMF) fiber with the M365FP1. Optical output power is specified for a Ø400 µm 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.

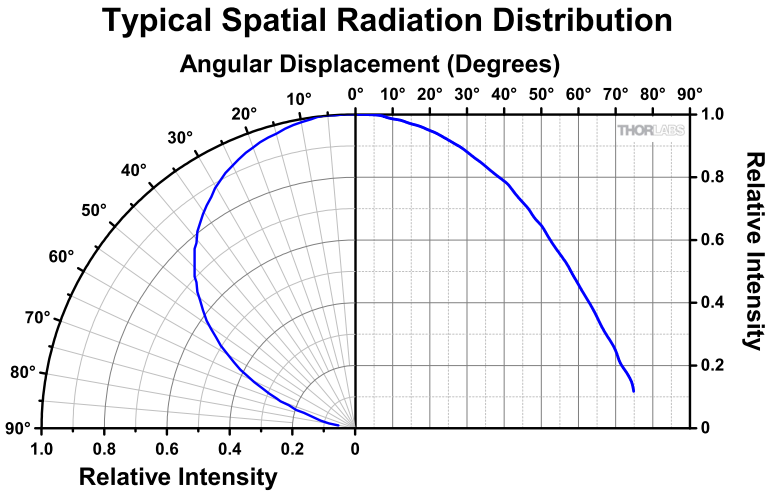
UV LEDs in conjunction with optical fibers exhibit a behavior which seems paradoxical at first glance: the high energy emission causes a change in the optical properties of the fiber, particularly the refraction index. This change will result in a slow decrease of insertion loss and improvement of coupling 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.

Performance Plots





For the bare LED.



For the bare LED.

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.

Maintenance and Service

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

The M365FP1 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 M365FP1 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

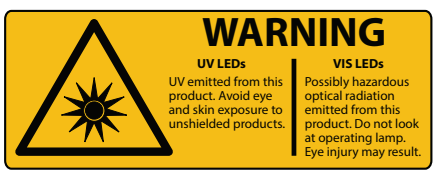
Inappropriate use of any Fiber-Coupled LED product may result in permanent eye damage. To prevent injury, use this product in accordance with the International Standard "Photobiological Safety of Lamps & Lamp Systems" IEC 62471. This product falls under Risk Group RG2 – Moderate Risk Group in accordance to the standard IEC 62471:2006.

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

During normal operation, 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 fins.

Please note that this product is not suitable for household room illumination.

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

All statements regarding safety of operation and technical data only apply when the unit is operated correctly according to its specifications. The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

Warning Statement
This LED radiates intense UV light during operation. Precautions must be taken to prevent looking directly at the light. If viewing the LED directly is necessary, protective glasses must be worn to avoid eye damage. Do not look directly into the LED or look through the optical system during operation, as this can be harmful to the eyes, even for brief periods of exposure due to the high intensity of the light.