

# litilit

# BIOLIT 2

Femtosecond Fiber Laser for Biophotonics  
1050 nm, 70 fs, 2 W, 15 – 40 MHz



[WWW.LITILIT.COM](http://WWW.LITILIT.COM)

## CLEAN PULSES LEAD TO SHARP IMAGES

### FEATURES

- Ultra-short and clean pulses
- Robust and stable
- Flexible repetition rate
- Maintenance-free & turn-key
- Integrated dispersion pre-compensation

### APPLICATIONS

- Multiphoton microscopy
- Neuroscience
- Photopolymerization
- Ophthalmology
- OPO pumping

# BIOLIT 2

The **Biolit 2** is a compact, air-cooled femtosecond laser designed for multiphoton microscopy, biophotonics and other non-linear optics applications.

The industrial-grade device is exceptionally robust, maintenance-free and affordable. A combination of ultra short (typ 60 fs) and clean pulses, superior beam quality and lower (compared to solid-state siblings) repetition rate enables unparalleled multiphoton imaging while preserving the object.

## SPECIFICATIONS

Model	Biolit 2	Biolit 2 SH <sup>1)</sup>
Central wavelength	1050 ± 5 nm	525 ± 5 nm
Average power	> 2 W	> 400 mW
Pulse duration	< 70 fs (60 fs typ.)	
Pulse duration stability <sup>2)</sup>	< ± 5 fs	
Pulse strehl ratio	> 0.9	
Tunable dispersion pre-compensation <sup>3)</sup>	-10 000 fs <sup>2</sup> ... +500 fs	N/A
Pulse repetition rate <sup>4)</sup>	15, 20, 30 or 40 MHz	15 or 20 MHz
Tuneable pulse repetition rate (optional) <sup>5)</sup>	1 – 40 MHz	
Analog power control	1 – 100 %	
Analog power control bandwidth	> 10 kHz – standard >300 kHz – optional	
Peak power	> 1 MW @ 20 MHz	>200 kW @ 20 MHz
Beam quality	$M^2 < 1.2$	
Beam circularity <sup>6)</sup>	> 0.9	

Model	Biolit 2	Biolit 2 SH <sup>1)</sup>
Beam diameter (1/e <sup>2</sup> level)	1.5 ± 0.3 mm	1.2 ± 0.3 mm
Beam pointing (pk-to-pk) <sup>2)</sup>	< 50 µrad	
Beam pointing vs temperature	< 25 µrad/°C	
Pulse energy stability (RMS)	< 1 %	< 2 %
Power stability (RMS) <sup>2)</sup>	< 1 %	< 2 %
Warm up time (cold start)	< 10 min	
Available control interfaces	USB, CAN	
Powering requirements	100 ... 240 V AC, 47 ... 63 Hz	
Operating temperature	15 – 35 °C	
Humidity	non condensing	
Transportation/storage temperature	- 20 – +70 °C	
Dimensions:		
Laser head (L × W × H)	334 × 217 × 139 mm	334 × 211 × 165 mm
Control unit (L × W × H)	449 × 370 × 140 mm	449 × 370 × 140 mm
Umbilical length	3 ± 0.3 m	
Colling:		
Laser head	air (passive)	
Control unit	forced air (fans)	

<sup>1)</sup> Biolit-2 SH model also has infrared (1050 nm) output with the same specifications as standard Biolit laser. Both outputs are available simultaneously.

<sup>2)</sup> Measured during 24 h operation after 10 min warm-up.

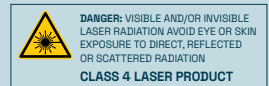
<sup>3)</sup> Equivalent of 100 mm of SF10 glass. Even higher dispersion (up to 30'000 fs<sup>2</sup>) of the external optical system can be pre-compensated in the factory on request.

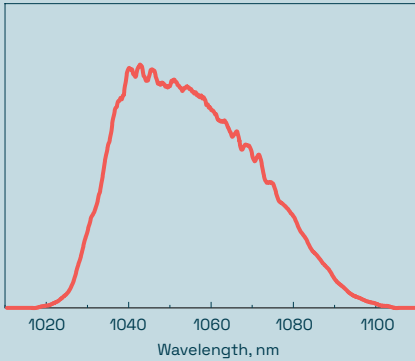
<sup>4)</sup> Factory preset. Other repetition rates are available on request. Please inquire for more details.

<sup>5)</sup> Output repetition rate can be described by formula  $RR = RR_0/N$ , where  $RR_0$  is fundamental repetition rate and  $N$  is integer number. Output power is dependent on both  $RR$  and  $RR_0$ . For power dependence on the repetition rate please contact LITILT.

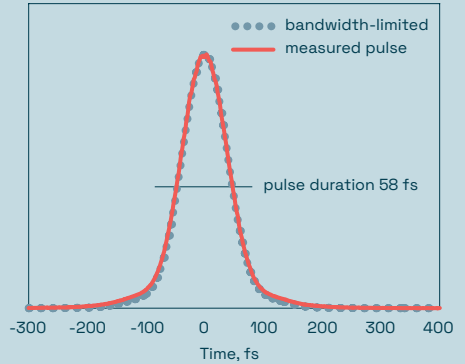
<sup>6)</sup> Defined as the worst case ellipticity along the z-scan ( $\pm 5 \times L_{\text{Rayleigh}}$ ) of the beam.

World patented technology: US10038297, JP6276471, EP3178137, CN106575849.

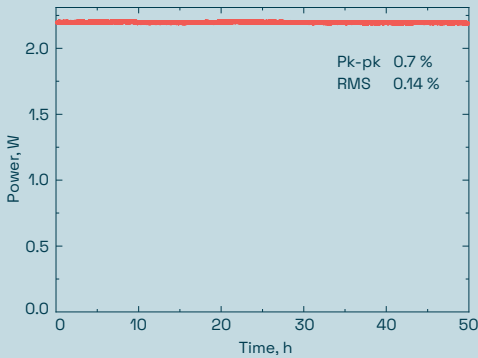




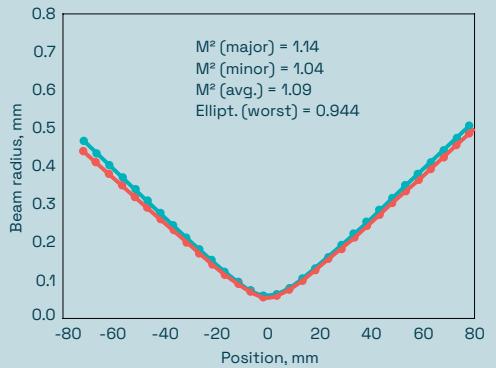
Output spectrum from **Biolit 2** laser



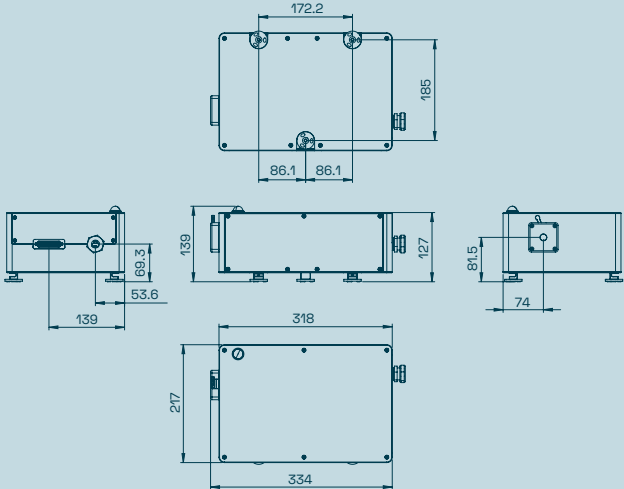
Measured autocorrelation function of the pulses from **Biolit 2** laser



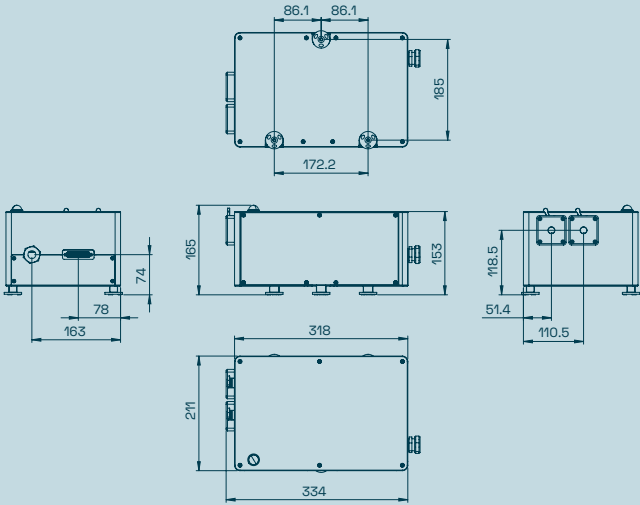
Long term power stability of **Biolit 2** laser (at 1050 nm)



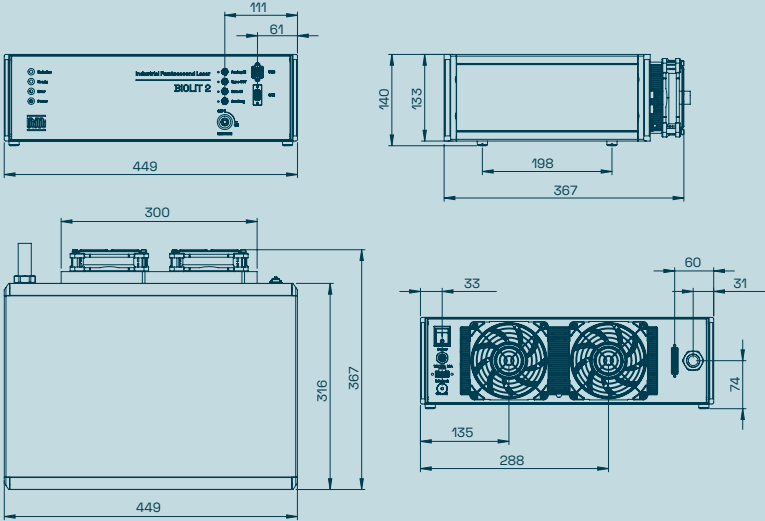
Beam diameter dependence on propagation distance (z-scan) of **Biolit 2** laser and  $M^2$  fit



Drawing of Biolit 2 laser head (in mm)



Drawing of Biolit 2 SH laser head (in mm)



Drawing of Biolit 2 power/control supply (in mm)