



YLPF-FlexO

Femtosecond Fiber Laser with Pulse Shaper

NEW PRODUCT

IPG Photonics' **YLPF-FlexO** femtosecond lasers offer the user unprecedented flexibility in choosing parameters optimal for the application. The YLPF-FlexO laser provides ultrashort sub-50 fs, >40 nJ pulses at 11 MHz repetition rate. The laser system incorporates IPG's proprietary pulse shaping technology that provides the ability to choose a desired temporal pulse shape, from the shortest near-transform-limited pulse to a variety of programmable shapes. Shaped time-domain profiles and multi-pulse waveforms within +/- 3 ps time window can be created by the user via spectral phase and amplitude shaping. Negative chirp up to 15,000 fs² can be added to the output pulse, equivalent to pulse broadening up to 1 ps. The linear chirp and higher-order dispersion corrections can be used for pre-compensation of pulse distortions by optical components in customer's pulse delivery line. The pulse shaping technology can be incorporated in a closed-loop setup responding in real time, on the sub-second time scale, to input from external diagnostics.

The ability to select the optimal pulse shape and sequence combined with IPG's highly reliable fiber architecture makes these femtosecond lasers the perfect source for a wide range of scientific, biomedical, and advanced applications.

Optional extensions such as harmonic generators, higher output pulse energies and powers as well as variable repetition rate, from a single pulse to 11 MHz and its multiples, are planned.



Applications

- ▶ Scientific and Advanced Applications
- ▶ Bio-imaging and Multiphoton Microscopy
- ▶ 3D Micro Printing
- ▶ Analytical Chemistry
- ▶ Terahertz Generation
- ▶ Pumping OPOs
- ▶ Seeding Amplifiers



Features

- ▶ Pulse Duration from 40 fs
- ▶ Output Power up to 1.1 W
- ▶ Programmable Pulse Shape : Transform-limited or Shaped Pulses on Demand
- ▶ Rugged Industrial Design, High Reliability, Long Lifetime
- ▶ Repetition Rate 11 MHz
- ▶ Environmentally Sealed

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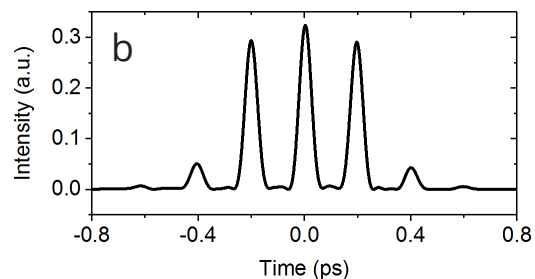
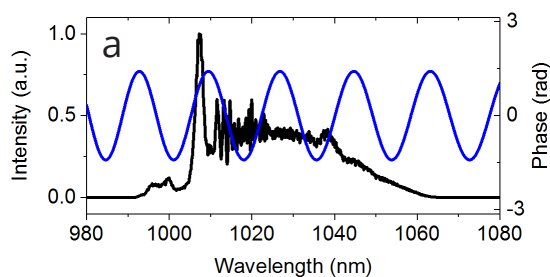
Specifications	YLPF - FlexO - 40	YLPF - FlexO - 100 [§]
Mode of Operation	Pulsed	
Central Wavelength, nm	1030 ±10	
Repetition Rate, MHz	11	
Temporal Pulse Shape	Programmable*	
Programmable Device	2D LCOS Spatial Light Modulator, 1272×1024	
Pulse Control Variables	Phase and Intensity*	
Pulse Shaping Mode	Diffractive	
Programmable Time Range**, ps	>6	>5
Minimum Pulse Duration***, fs	<60, typ.50	<50, typ. 40
Pulse Energy***, nJ	>40	>100
Average Power***, mW	>440	>1100
Polarization	Linear, 100:1	
Beam Mode Quality***	$M^2 < 1.2$	
Beam Diameter, mm	2.8	
Warm-up Time, min	up to 10	
Console Dimensions (W × D × H), mm	448 × 580 × 132	
Optical Head Dimensions (W × D × H), mm	178 × 359 × 115	

§ Preliminary specifications

* Programmable spectral phase and transmission are encoded on every laser pulse, without synchronization with the laser source. This frequency-domain pulse shaping translates into corresponding changes of the time-domain profile.

** FWHM of the second-harmonic generation intensity profile as a function of shaper-assisted time delay.

*** With dispersion compensation mask applied (shortest pulse duration); no transmission mask.



Generation of periodic pulse sequences via phase-only shaping with no loss of laser power: a sinusoidal phase mask is applied across the laser spectrum (a) to create desired pulse train (b). The time period can be tuned by adjusting the phase modulation frequency.

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MAX. AVERAGE OUTPUT POWER: 2.2 W
MAX. PEAK OUTPUT POWER: 4 MW
PULSE DURATION: 30 fs - 20 ps
PULSE REPETITION RATE: <=15 MHz
WAVELENGTH RANGE: 900-1200 nm

DANGER - INVISIBLE LASER
RADIATION AVOID EYE OR SKIN
EXPOSURE TO DIRECT OR
SCATTERED RADIATION
CLASS 4 LASER PRODUCT

IEC 60825-1:2014

The Power to Transform®