

Y-Fi Series - High Power and Repetition Rate Near-IR Ultrafast Fiber Lasers

Thorlabs recently acquired the Y-Fi product line from KMLabs, and this datasheet is currently being reviewed. An updated specification sheet in Thorlabs' template will be available in the coming weeks. Please refer to the website for the most up-to-date information.

Applications Include

- OPCPA seeding
- Multiphoton microscopy
- Chemical spectroscopy
- Precision micromachining of tissues, glass, and plastics

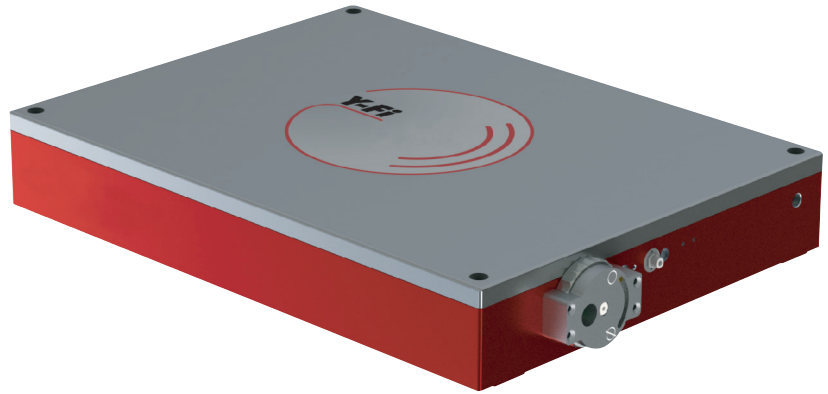
Features

- Average power: 20 W / 50 W (Y-Fi HP / Y-Fi Ultra)
- < 170/190 fs pulse length with low pulse pedestal gives improved performance for driving nonlinear optical interaction: optimum efficiency at lower pulse energy / average power
- Tunable repetition rate (0.5-15, 60 MHz)
- Fully integrated, ruggedized, hands-free laser source
- Stable over large temperature range (16-26° C)
- Graphical, intuitive software control with integrated diagnostics
- Computer controlled pulse width precompensation: optimize your experiment with no external prisms or gratings
- Small optical head footprint (~ 30 x 45 cm) for Y-Fi HP

Standard Options

- Y-Fi SHG provides > 8W of 517-nm light at 10 MHz
- Y-Fi SHG Pulse Modulation Option - integrated within housing for compact, one-box solution

Ultra-compact mJ-class femtosecond fiber laser with unprecedented performance: clean pulses with duration as short as <170 fs



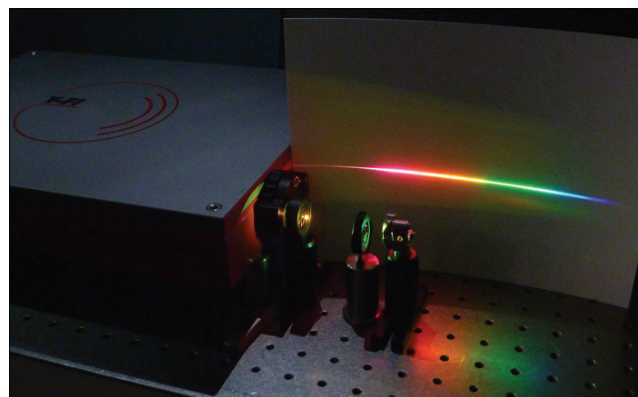
The Y-Fi™ laser series is a family of high average power, high repetition rate near-IR ultrafast fiber lasers. Y-Fi products are based on a single rugged opto-mechanical platform and are engineered for hands-free operation.

Y-Fi Outstanding Characteristics

The Y-Fi system employs a patented all normal dispersion (ANDi) modelocked fiber laser coupled with a fiber amplifier. This configuration offers numerous unique advantages, including:

- Bandwidth supporting sub-100 fs pulses
- High output energy from oscillator requires less amplification for shorter, low temporal pedestal pulses
- Robust long-term operation

The short, clean pulses of the Y-Fi laser series deliver more peak intensity per μJ than competing products. KMLabs guarantees both pulse duration and pedestal energy content, verified with a FROG pulse measurement, to ensure each laser pulse is free of picosecond background that robs energy from the main short pulse. Thus, more of the laser output is truly usable, requiring less energy/average power and decreasing the probability of seeing collateral damage and other detrimental interactions.



Bulk White-Light Generation with Y-Fi HP

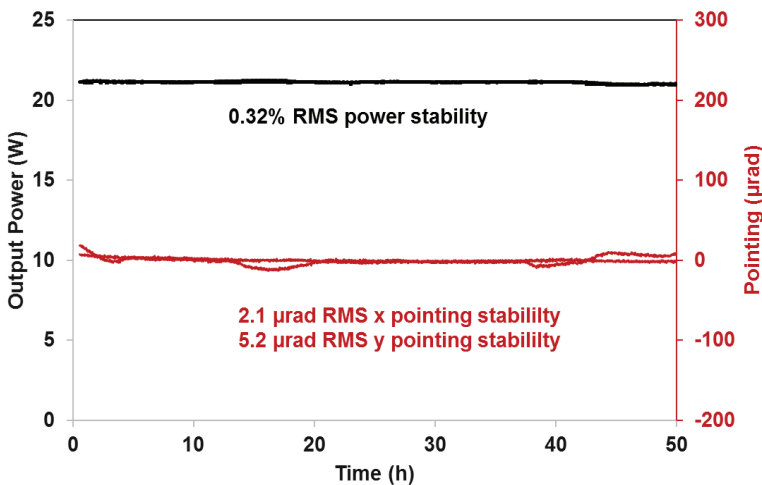
Contact us for full specifications or with questions

Key Specifications

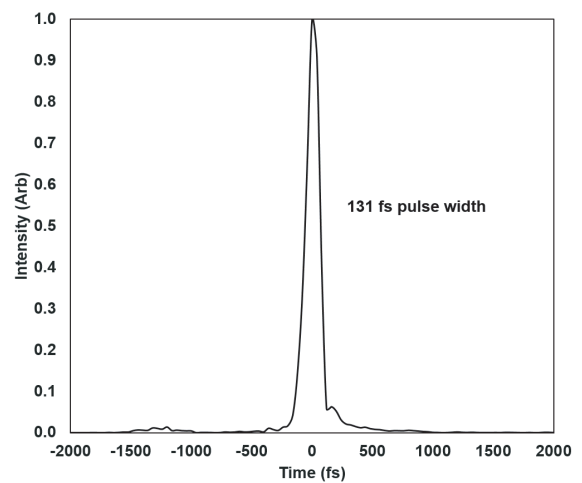
Parameter	Y-Fi™ HP	Y-Fi™ HP Ultra
Pulse Width	<170 fs	<190 fs
Compressor Dispersion Pre-compensation	$\pm 10,000 \text{ fs}^2$	$\pm 10,000 \text{ fs}^2$
Center Wavelength	$1035 \pm 5 \text{ nm}$	$1035 \pm 5 \text{ nm}$
Beam Quality	$M^2 < 1.2$	$M^2 < 1.2$
Average Power	>20 W @ 10 MHz	>50 W @ 10 MHz
Peak Power	> 10 MW, calculated via FROG	> 80 MW, calculated via FROG
Repetition Rate	0.5 - 15, 60 MHz	0.5 - 15, 60 MHz
Pulse Energy	>3 μJ @ 1 MHz	>40 μJ @ 1 MHz
Auto-Correlation Pedestal Content	< 15%	< 20%
Background content	< 1.0%	< 2.0%
Pre-Pulse Contrast	< 0.5%	< 1%
Post-Pulse Contrast	< 0.5%	< 1%
Power Stability*	<1% RMS over 12 hours after 30 min warm-up	<1% RMS over 12 hours after 30 min warm-up
Pointing Stability*	< 10 μrad RMS after 30 min warmup	< 10 μrad RMS after 30 min warmup
Operational Temp. Range	16 – 26 °C	16 – 26 °C
Physical Configuration	12"x16"x2.4" (optical head)	24"x48"x8" (optical head)
Computer Interface	Laptop provided, w/GUI	Laptop provided, w/GUI

* Ambient $\pm 0.5 \text{ C}$, after 30 minute warmup

Y-Fi HP Example Data



Y-Fi HP power and pointing stability over 50 hours, in typical lab conditions



Y-Fi HP clean 131 fs pulses at 20W output (2 μJ , 10 MHz), measured with frequency resolved optical gating (FROG).