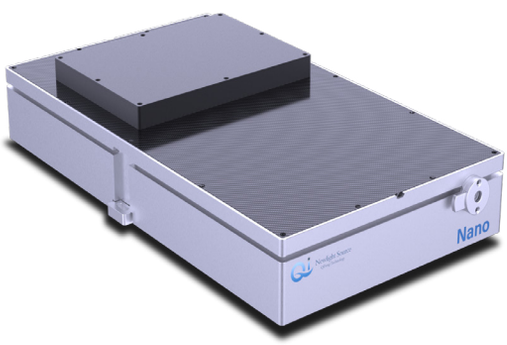
Nano

Ti:Sapphire femtosecond oscillators

The Nano Ti:Sapphire oscillators are specialized femtosecond lasers seed light for scientific users. This series of products have the advantages of highly integrated design, long-term stabilization, and can provide customized wave-length, pulse width and phase-locked synchronization function. They are widely used in the fields of laser amplification, THz generation,biomedical imaging,biomedical detection and so on.

Product Features

- Hand-free and industrial-grade reliability
- compact and high integration
- Phase-locked synchronization function
- Customer-specified central wavelength and pulse width



Typical Applications

- The Seed Source for Ti:Sapphire Amplifiers
- THz generation
- Ultrafast Time-domain Resolved Spectroscopy
- Coherent Anti-Stokes Raman Spectroscopy
- Multiphoton microscopic imaging

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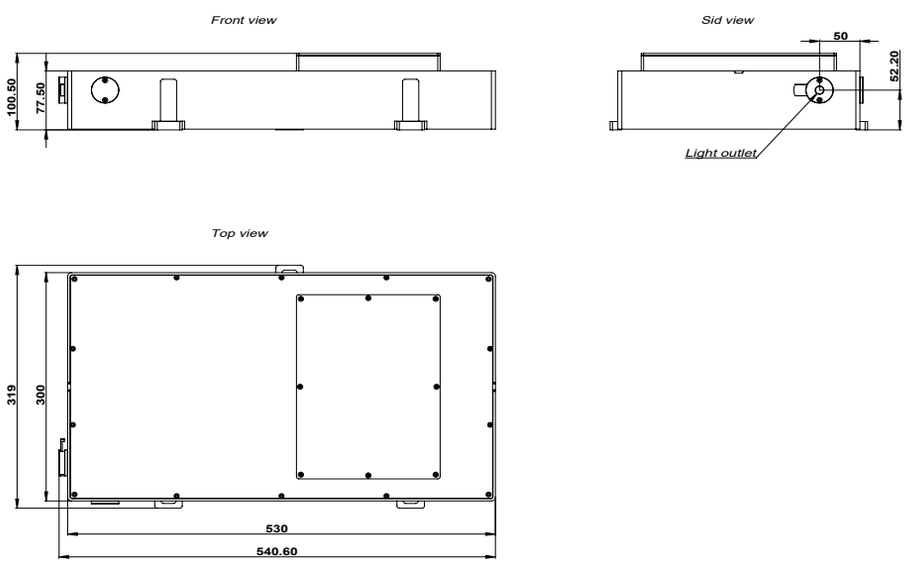
Specifications

	Nano-15	Nano-100
Central wavelength	~800 nm	
Average power	＞200 mW	＞300 mW
Repetition rate	80 MHz	
Spectral width (FWHM)	＞100 nm	＞20 nm
Pulse width	~15 fs	~100 fs
Power stability[1]	＜0.5% (RMS)	
Beam quality	TEM_{00} ((both axis, M^2<1.3)	
Beam dimension ($1/e^2$)	2 mm (RMS)	
Polarization state	Horizontal linear polarization	

1 Power stability measured for 8 hours under stable ambient conditions。

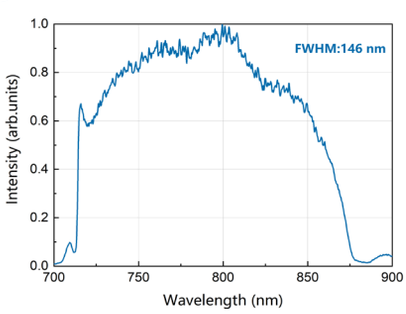
External Dimensions



Dimensions of Nano oscillators

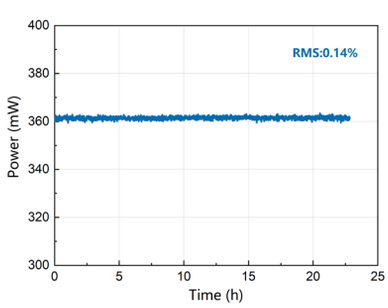
Typical Data

1



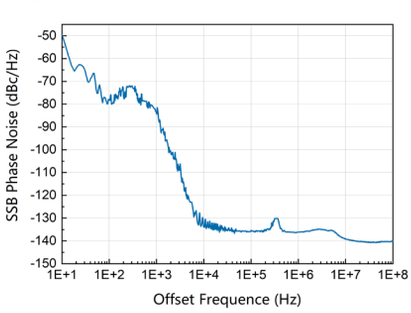
Output spectrum of Nano-15

2



Nano-100 power stability

3



Nano-phase noise test results

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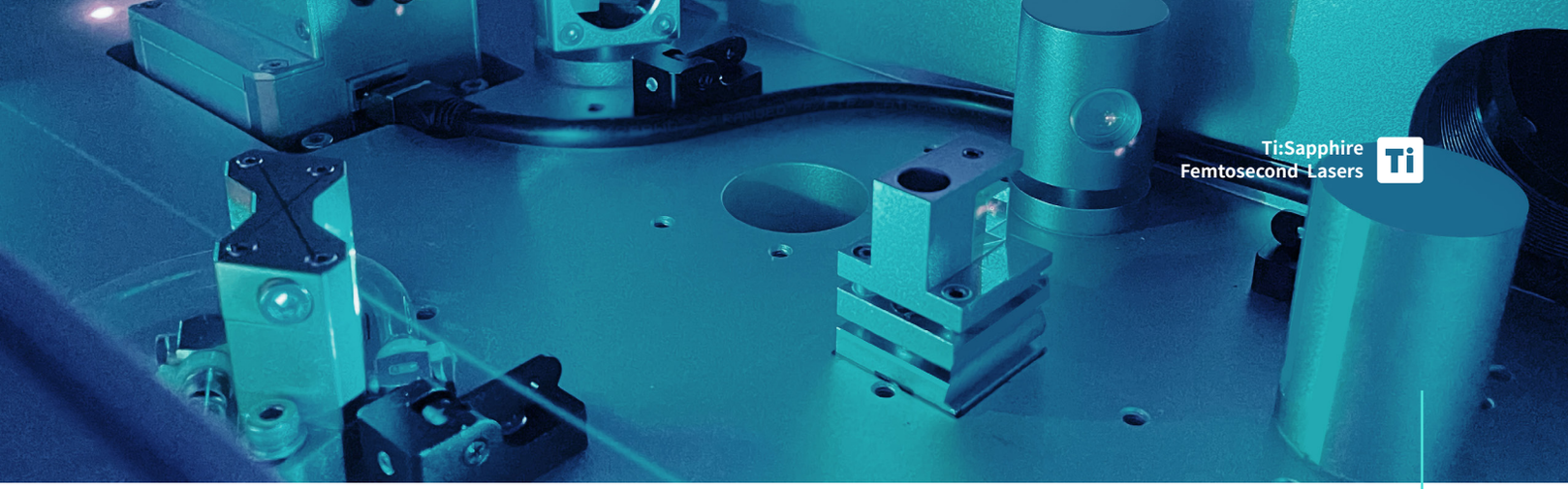

Lancer

mJ-energy
Ti:Sapphire femtosecond amplifiers

Lancer is the compact Ti:Sapphire amplifier worldwide. Amplified by first-stage regeneration, providing single pulse energy up to 15 mJ, repetition rate from 1Hz to 1 kHz optional, pulse width adjustable ranging from 30 fs-1 ps.

Lancer utilizes unique large mode field amplification and dual-end pump techniques to achieve high energy and high beam quality while maintaining good pointing stability and spot distribution stability. At the same time, due to the double protection design of one-box outer shell and the module seal, Lancer can still maintain high product reliability and stability in non-laboratory environments.

In addition to standard products, Lancer can provide a variety of customized solutions, including SHG/THG optional, phase-locked synchronization function, customer-specified central wavelength and pulse width to maximize the needs of related scientific applications.

Product Features

- Industrial-grade reliability
- Highly integrated mechanical design
- Pulse energy up to 15 mJ
- Pulse width adjustable from 30 fs to 1ps
- Repetition rate from 1 Hz to 1 kHz optional
- Phase-locked synchronization function
- SHG/THG optional
- Customer-specified central wavelength and pulse width

Typical Applications

- Optical parametric amplifier pumping
- Ultrafast transient absorption spectroscopy
- Free electron laser (FEL) seeding
- Femtosecond pulse deposition
- Plasma femtosecond optical probe
- Higher harmonic generation (HHG)
- Pre-stage light source for TW/PW large scientific installations

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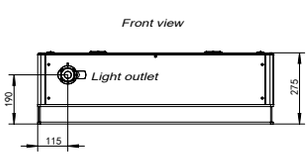
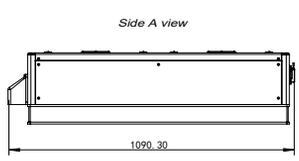
Specifications[1]

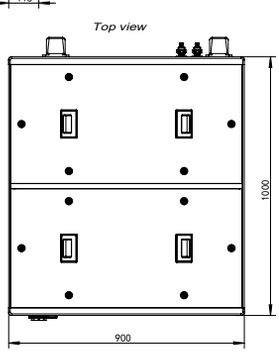
	Lancer-D10	Lancer-N10	Lancer-K3	Lancer-K7	Lancer-K13
Central wavelength[2]	780-820 nm (nominal), SHG/THG optional				
Pulse energy[3]	7-15 mJ optional		>3 mJ	>7 mJ	>13 mJ
Repetition rate[4]	10 Hz	100 Hz	1 kHz		
Pulse width[5]	30 fs/100 fs-1 ps adjustable				
Power stability[6]	<1.0% (RMS)		<0.5% (RMS)		<0.75% (RMS)
Contrast Ratio Pre-Pulse and Post-Pulse[7]	>1000:1 ; >100:1				
Beam quality	TEM_{00}, M^2<1.4		TEM_{00}, M^2<1.3	TEM_{00}, M^2<1.4	TEM_{00}, M^2<1.5
Beam dimension($1/e^2$)	10 mm (nominal)		6 mm (nominal)	10 mm (nominal)	13 mm (nominal)
Beam pointing stability[8]	<10 μrad (RMS)				
Divergence angle	<0.5 mrad				
Polarization state	Linear, horizontal[9]				
Phase-locked synchronization	Optional, timing jitter <100fs				

1 All specifications apply at 800nm. Due to continuous product improvements, specifications are subject to change without notice.
2 Customer-specified central wavelengths, second/third harmonic generation are optional.
3 Models with lower output energy are optional.
4 Repetition rate up to 10 kHz, please contact us for details.
5 Minimum pulse duration (30 fs or 100 fs) should be noticed in advance.
6 8-hour RMS value at full energy.
7 Defined as the ratio between pulse peak intensity of output pulse to peak intensity of any pre-pulse that occurs >1ns before and after the output pulse.
8 8-hour RMS value at full energy at ambient temperature 25°C with fluctuation <±0.5°C.
9 Some models are vertically linear polarized, please contact us for details

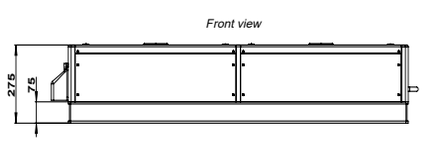
External Dimensions

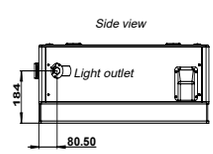


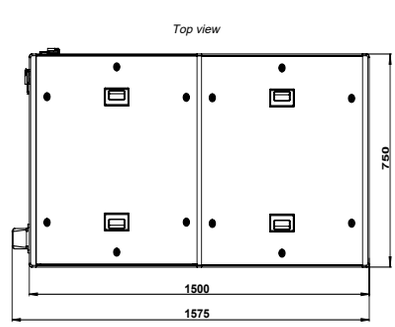




Dimensions of Lancer-K3







Dimensions of Lancer-K7

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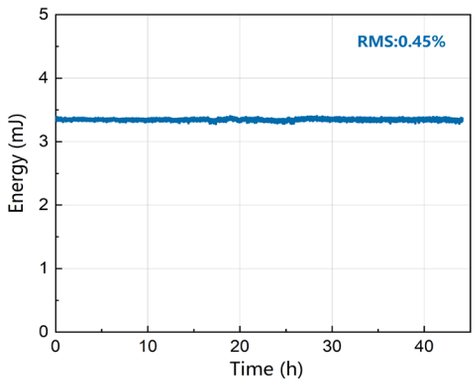
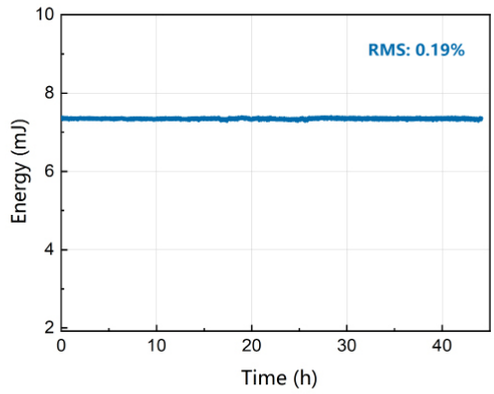
Typical Data

1



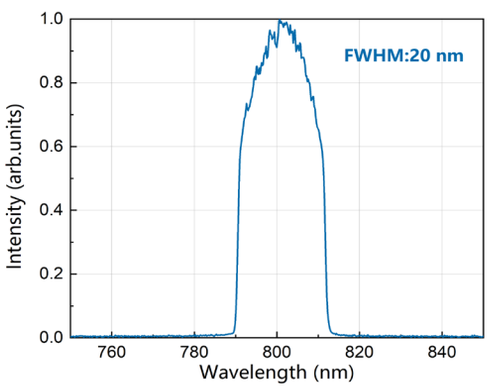
Lancer-K3 energy stability

2



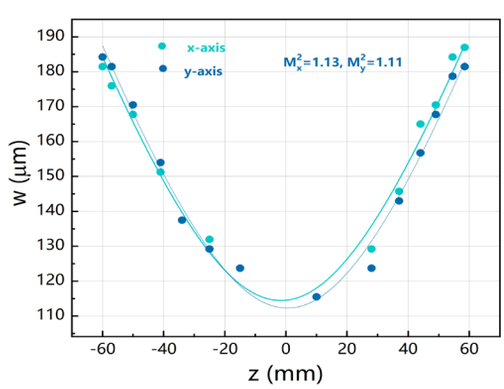
Lancer-K7 energy stability

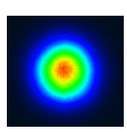
3



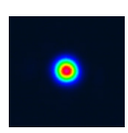
Output spectrum with 30-fs pulse duration

4





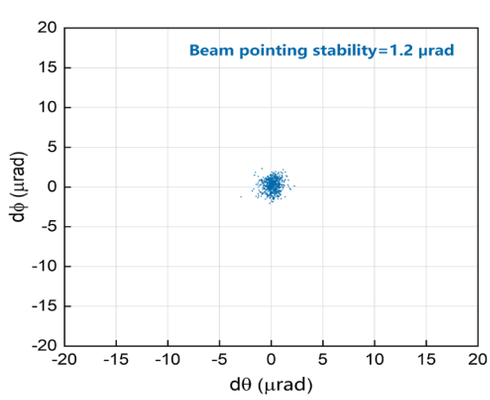
Near field



Far field

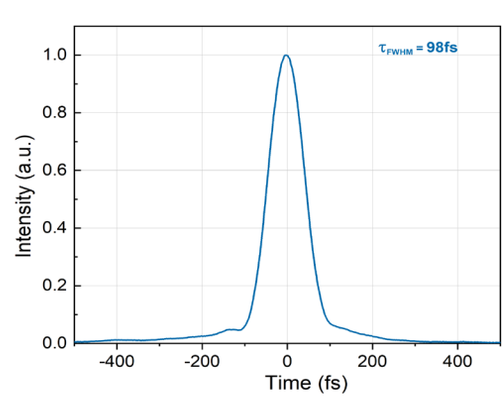
Beam quality

5



Beam pointing stability

6



100-fs pulse duration

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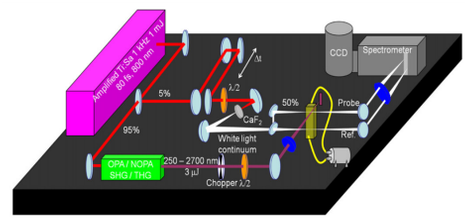
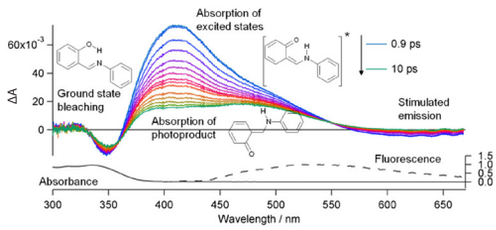
Typical applications

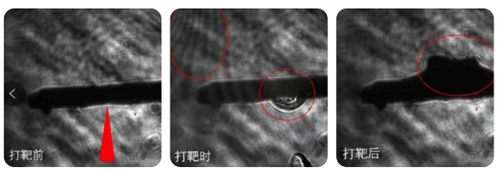




▲ Observed signals in femtosecond transient absorption

1

Ultrafast transient absorption spectroscopy

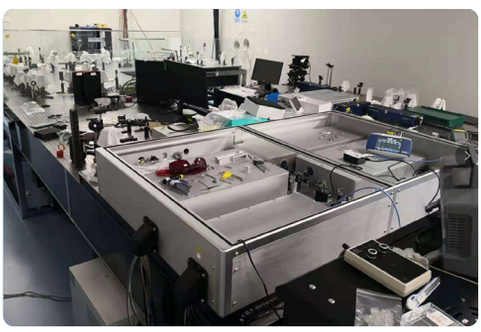


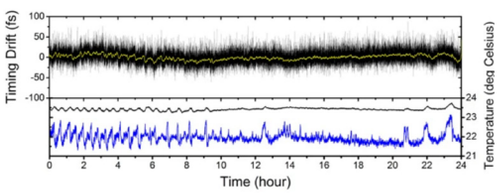
▲ Plasma evolution within femtosecond time-scale

2

Plasma femtosecond optical probe

Thank you to Beijing Normal University for providing relevant data



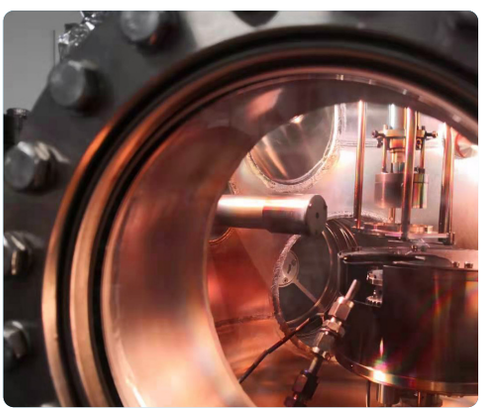


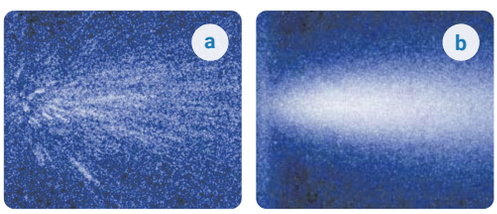
▲ Synchronizing timing drift measurement data over 24 hours

3

Laser driven photocathode generates ultrafast electrons and X-rays

Yang, H., Han, B., Shin, J. et al. Sci Rep 7, 39966 (2017)





▲ CCD camera plume images recorded from the ablation of BaTiO3 after the laser pulse in nanosecond regime (a) and femtosecond regime (b)

4

Femtosecond pulse deposition

Thanks to the Institute of Physics, Chinese Academy of Sciences for providing relevant pictures and information

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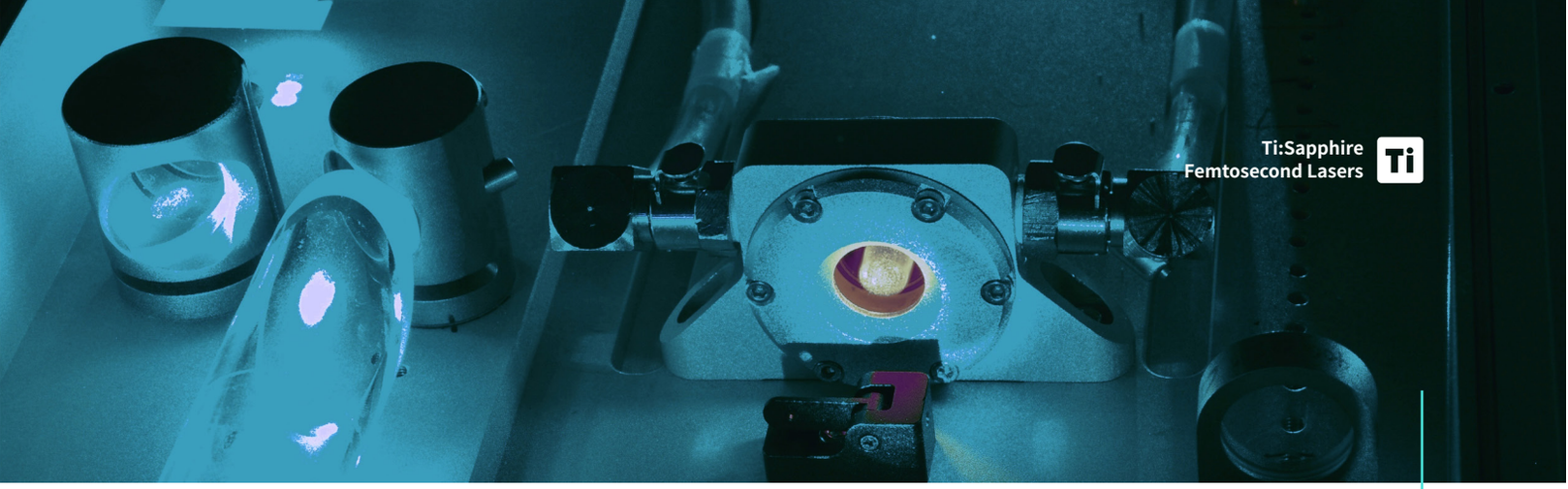

Flare

Ti:Sapphire multipass amplifiers

Flare is a multi-pass amplification module designed for energy upgrades in Ti:Sappire laser systems. Combined with the customer's existing 10 Hz-1 kHz Ti:Sappire femtosecond laser prestage, the Flare amplifiers can boost pulse energy from 50 mJ to 1000 mJ. With its good system compatibility and a variety of optional energy indicators, Flare is the choice for customer system upgrades.

Flare uses a variety of advanced technologies to achieve superior performance. The unique mirror-folded multipass technology ensures better thermal management and reduces the system size to 1/2 of the conventional one. The ultrafast pockels cell module enable Flare's nanosecond contrast to be better than 10^6, and cross-polarization wave technology boosts picosecond contrast to 10^{10}. The optional deformation mirror technology perfectly corrects the laser wavefront distortion, so that the output laser can combine high energy and high beam quality.

In addition, the Flare multipass amplifier can be used with Chameleon harmonic generators to achieve laser output for SHG and FHG.

Product Features

- Customized multi-pass amplification modules
- Output energy up to 50-1000 mJ
- mirror-folded multipass amplification technology
- Wavefront distrortion correction with deformable mirror optional
- BHG、SHG optional

Typical Applications

- Ti:Sapphire laser energy enhancement
- Laser wake field acceleration
- Ultrafast electron diffraction
- High-energy physics
- Higher harmonic generation (HHG)
- Prestage light source for TW and PW large scientific facilities

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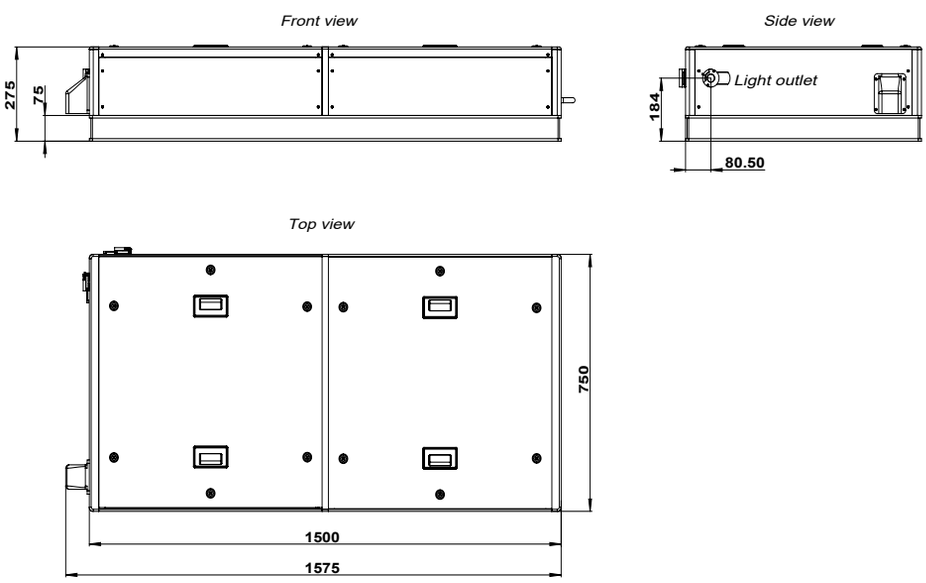
Specifications [1]

	Flare-50	Flare-250	Flare-500	Flare-1000
Central wavelength[2]	800±10 nm, SHG/THG optional			
Max pulse energy[3]	＞50 mJ	＞250 mJ	＞500 mJ	＞1000 mJ
Pulse width	25 fs			
Repetition rate	10 Hz			
Energy stability[4]	＜1.2% (RMS)			＜1% (RMS)
Nanosecond pulse contrast[5]	$>10^8$:1			
Picosecond pulse contrast[6]	$>10^4$:1@1 ps; $>10^6$:1@5 ps; $>10^8$:1@10 ps; $>10^{10}$:1@100 ps			
Beam quality	TEM_{00} (both axes, $M^2<1.5$)			
Beam dimension($1/e^2$)	~20 mm	~25 mm	~35 mm	~45 mm
Strehl ratio	>0.85 (deformable mirror)			
Beam pointing stability[7]	<5 μrad (RMS)			
Polarization state	Linear, horizontal			

1 All specifications apply at 800 nm. Due to continuous product improvements, specifications are subject to change without notice.
2 Customer-specified central wavelength.
3 Customer-specified pulse energy
4 Energy stability measured for 8 hours under stable ambient conditions.
5 Under conditions that the preamplifier better than 10^8:1.
6 Designed according to customer needs.
7 RMS measured for 8 hours at full energy operation, ambient temperature of 21 °C ± 0.5 °C.

External Dimensions



Dimensions of Flare

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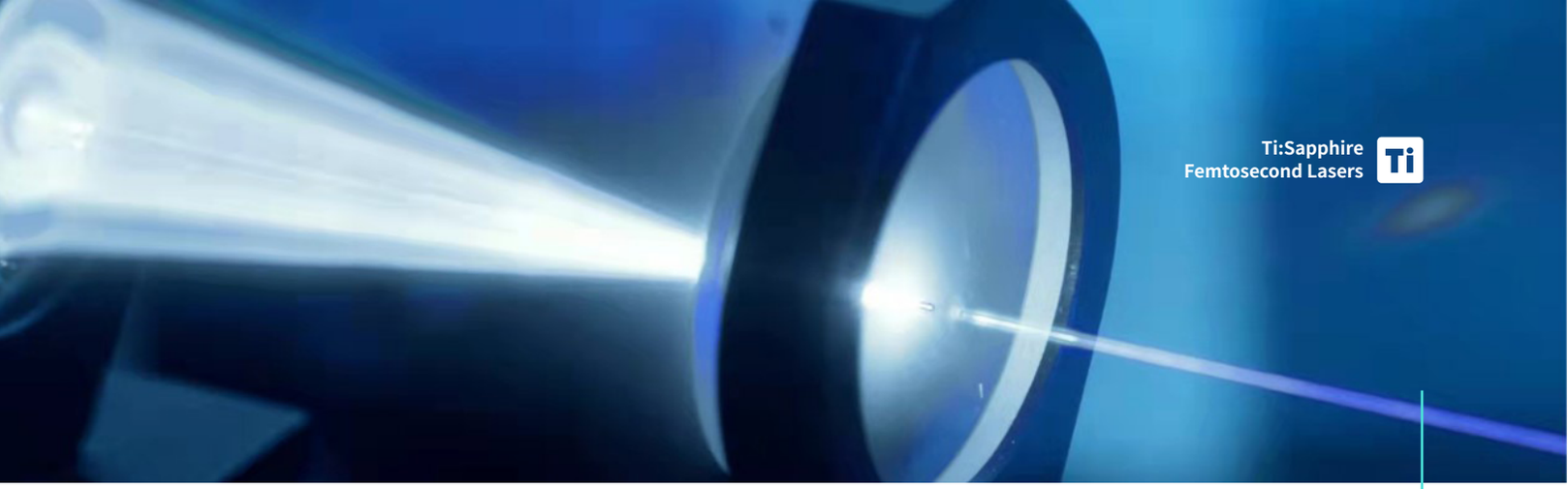


Ti:Sapphire
Femtosecond Lasers

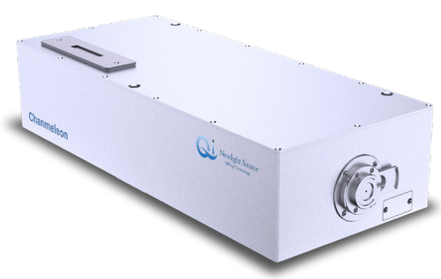
Chameleon

High efficient femtosecond harmonic generator

The Chameleon can output high power harmonic lasers at 400 nm, 266 nm and 200 nm. The unique and efficient design compensates for time delay and easy alignment, resulting in improved harmonic output efficiency with good beam quality and low dispersion. In addition, by changing the matching of the crystal and lens, harmonic output of other wavelengths can be realized to meet customer needs.

Product Features

- High conversion efficiency
- Small walk off angle
- Synchronous output
- Good beam roundness
- Flexible fixing and easy maintenance
- Optional cross-correlation instrument, temperature and humidity monitoring, spectrum monitoring, etc



Typical Applications

- Free electron laser (FEL) seeding
- Femtosecond ultraviolet laser micro/nano processing
- Surface modification of the materials
- Efficient harmonic conversion

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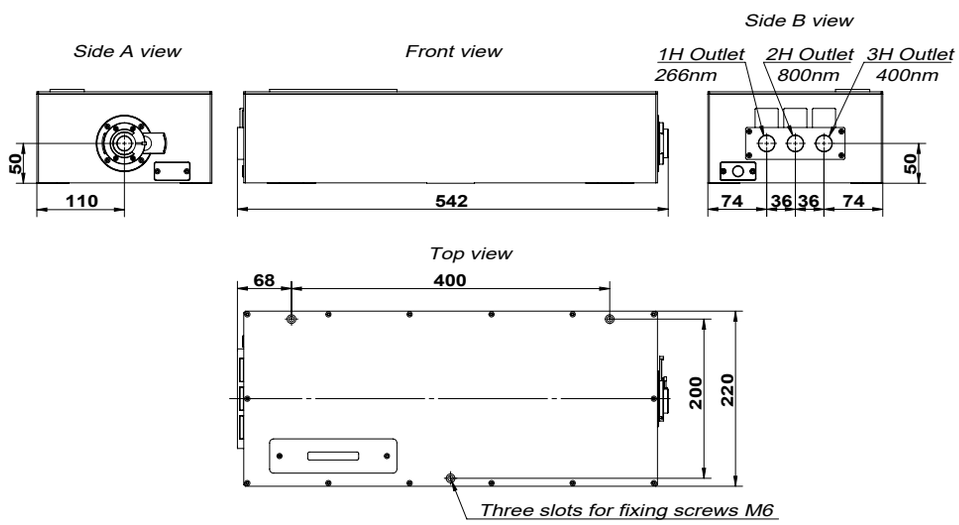
Specifications

	Chameleon
Input center wavelength	780-820 nm
Input pulse width	10-1000 fs
Output center wavelength	390-410 nm (SHG) 260-273 nm (THG) 195-205 nm (FHG)
Input polarization	horizontal
Input pulse energy	⩽15 mJ
Conversion efficiency	30-50% (SHG), 5-30% (THG), 1-10% (FHG)
Output pulse width	<100 fs (SHG), <250 fs (THG), <1000 fs (FHG)
Beam dimension (1/e²)	⩽15 mm
Repetition rate	⩽1 kHz
Cavity Dimensions	541 mm*220 mm*115 mm

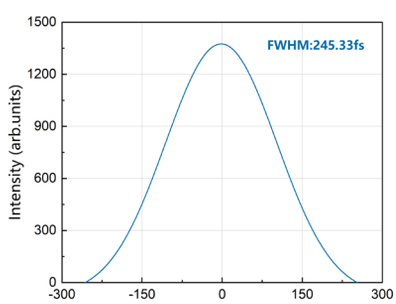
External Dimensions



Dimensions of Chameleon

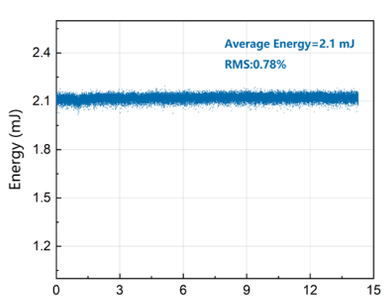
Typical Data

1



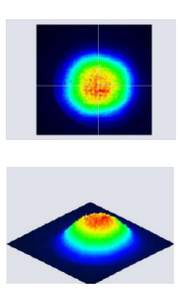
266 nm laser pulse width

2



266 nm laser energy stability

3



Spot distribution

Henan QiFeng Newlight Source Technology Co.,Ltd.
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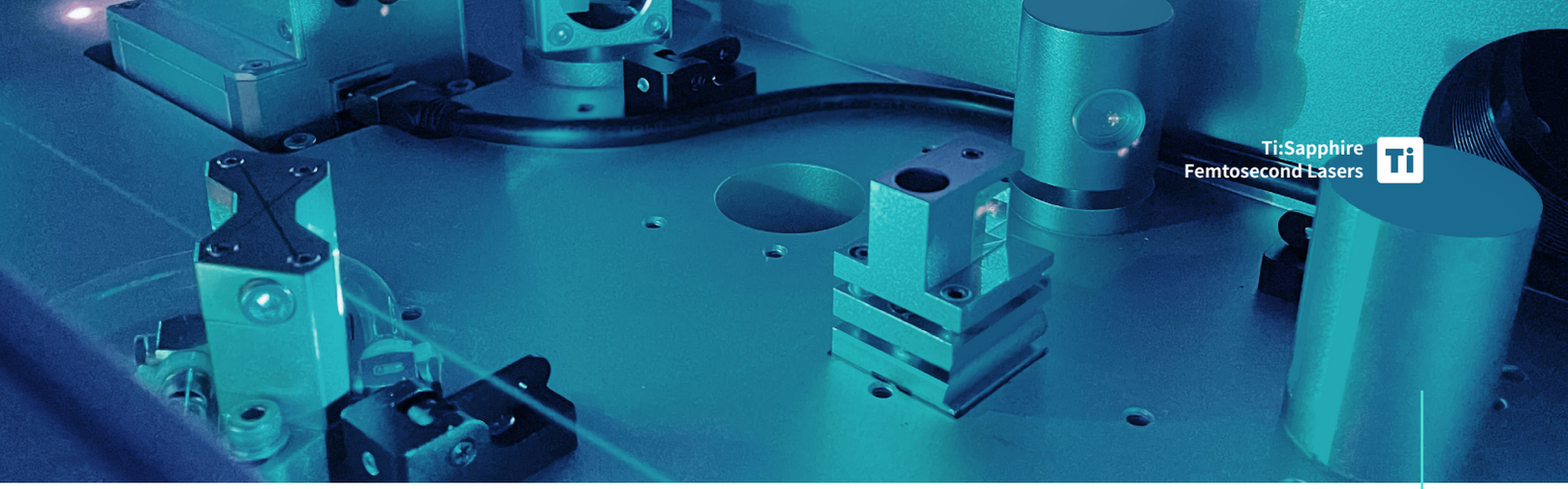
Newlight Source
QiFeng Technology



QOPA

Optical parametric amplifier

In order to expand the wavelength output range of Ti:Sapphire femtosecond amplifier, QiFeng Newlight Source Technology developed QOPA femtosecond optical parametric amplifier, with Lancer series Ti:sapphire femtosecond amplifier as the pump source, QOPA can achieve full coverage of output wavelength from ultraviolet to mid-infrared band, which can be widely used in ultrafast spectroscopy, terahertz spectroscopy and other fields.

QOPA adopts an all-in-one design with fully automatic wavelength tuning function, which can be convenient for users and system integration under the premise of ensuring reliability.

Product Features

- High conversion efficiency
- Tuning range from189 nm-20 μm
- High emit stability in full tuning range
- Fully automatic wavelength tuning function

Typical Applications

- Ultrafast spectroscopy
- Nonlinear optics
- Terahertz spectroscopy
- Multiphoton microscopy

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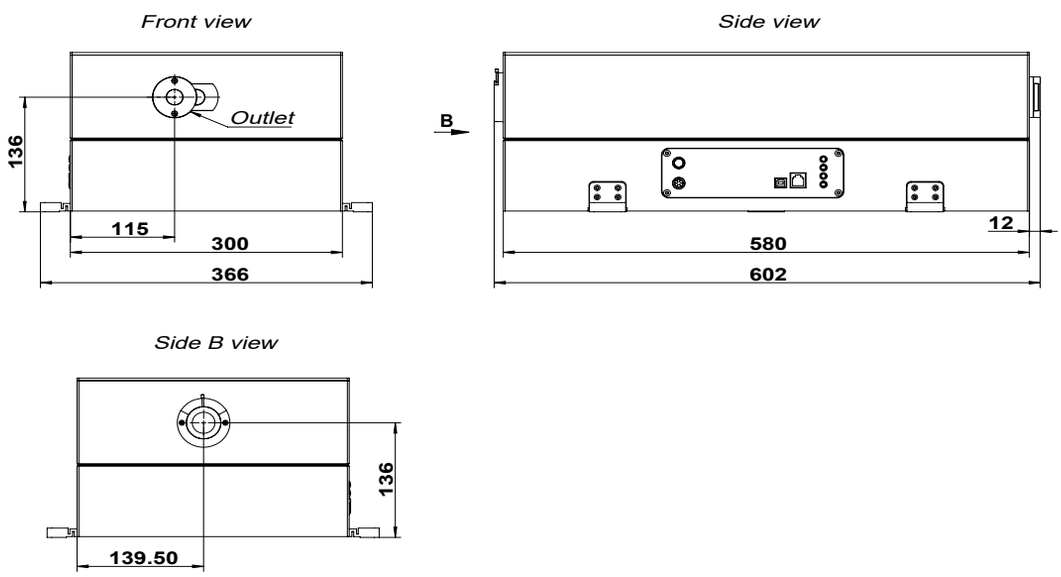
Specifications [1]

	Wavelength range	Peak energy[2]	
		<35 fs pump	<100 fs pump
QOPA	1160-1600 nm(Signal)	>250 μJ(S+I)	>250 μJ(S+I)
	1600-2600 nm(Idler)		
Optional [3]			
Extended wavelength module[4]	800-1160 nm	>15 μJ	>30 μJ
	580-800 nm	>30 μJ	>80 μJ
	533-600 nm	>30 μJ	>50 μJ
	475-533 nm	>40 μJ	>70 μJ
	400-480 nm	>2.5 μJ	>6 μJ
	290-400 nm	>5 μJ	>15 μJ
	266-295 nm	>3 μJ	>7 μJ
	240-266 nm	>3 μJ	>8 μJ
	189-240 nm	>1 μJ	>3 μJ

1 All specifications apply at 800nm pump. Due to continuous product improvements, specifications are subject to change without notice.
2 Parameters under 1 mJ energy pump; The output energy is linearly proportional to the pump energy used. When DUV189-240 nm modules are included, the peak light energy decreases in some bands, please contact us for details.
3 Wavelengths can be extended to 20 μm, please contact us for details.
4 Users can select the module of the required wavelength, and we provide customized product solutions for users.

External Dimensions



Dimensions of QOPA

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