PHOTOACOUSTIC & BIOPHOTONIC LASERS

Photonics Industries offer lasers with wavelength from the MIR (up to 3.4um) to the Vacuum UV (VUV) (as short as ~193nm) at high pulse energies and at kHz rep rates for emerging Photoacoustic & other Biophotonic applications.

Wavelength Ranges and Features

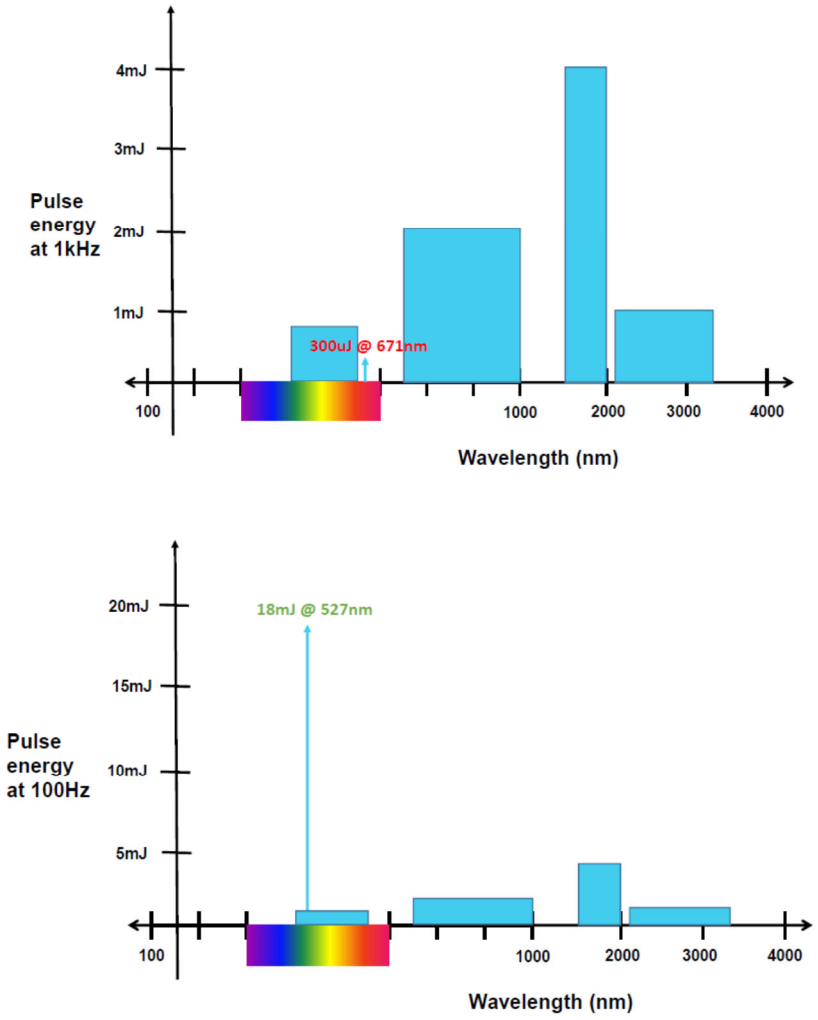
- **Mid IR MIR (2.2um to 3.4um) up to 1mJ at 1kHz**
- **"Golden Window" SWIR (1.5um to 2um) up to 4mJ at 1kHz**
- **Blood Window (750nm to 1um) up to 2mJ at 1kHz**
- **Blood Window (tunable 700nm to 900nm) up to 1mJ at 1kHz**
- **Visible (671nm) up to 300uJ at 10kHz**
- **Visible (500nm to 667nm) up to 800uJ at 1kHz**
- **Visible (527nm) up to 18mJ at 100Hz Air-cooled**
- **ns pulse width → narrow bandwidth laser**
- **Patented intracavity generation**
- **Excellent TEM_{00} beam quality**
- **Superior stability < 2%**

As data acquisition and image processing speeds increase there is a need to move to mJs of pulse energies at kHz prfs to make new laser based Photoacoustic & Biophotonic technologies competitive with conventional technologies. Photonics Industries' lasers unique features stem from our patented intra-cavity OPO frequency conversion technology. Conventional OPO systems use low repetition rate lasers, typically limited to 100Hz, to pump the OPO. Photonics Industries integrates our OPOs within the Q-switched based oscillator. This design produces kilohertz repetition rates, nominal 10ns pulse durations and milli-Joule (mJ) levels of pulse energy in a single, compact, industry reliable package.

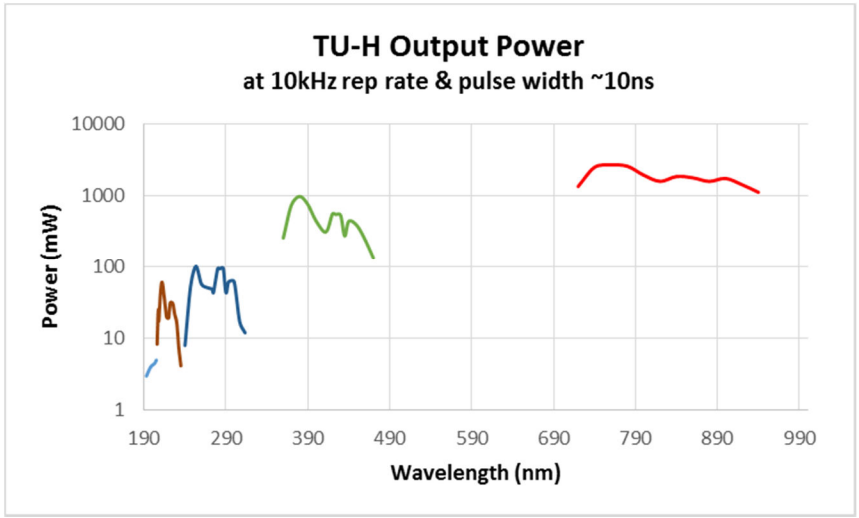
For tunable wavelength lasers, Photonics Industries' patented TU Series of nano second pulse width Ti:Sapphire lasers are tunable over a wide range of wavelengths and operate at high repetition rates while providing mJ of energy with a very narrow line width. The TU Series combines our field proven diode pumped Nd:YAG or Nd:YLF lasers with one Ti:Sapphire oscillator to provide a reliable and efficient tunable laser in a compact package. By minimizing dispersive optical components in the laser cavity, our TU Series lasers provides superior wavelength stability (typically <0.04 cm-1 over eight hours). The fundamental can be tuned from ~700 nm to ~940 nm. With sum and/or harmonic generations, the tuning range can be extended from 480 nm down to 193 nm.

Photonics Industries
International, Inc.

Fixed wavelength lasers are available at the following pulse energies and wavelengths:



Tunable wavelength lasers are available at the following power and wavelengths:



System Specifications

Wavelength	**fixed selectable from: 2.2 to 3.4µm**

Model	**DS-OPO (DP-OPO)**
Pulse energy	up to 1mJ @ 1kHz (up to 1mJ @ 100Hz aircooled)
Pulse Width (nominal)	6-15ns
Repetition Rate	Aircooled SS to 100Hz. Water cooled SS to 5kHz, 4-10kHz or 10-20kHz

Wavelength	**fixed selectable from: 1.5 to 2µm**

Model	**DS-OPO (DP-OPO)**
Pulse energy	up to 4mJ @ 1kHz (up to 4mJ @ 100Hz aircooled)
Pulse Width (nominal)	6-15ns
Repetition Rate	Aircooled SS to 100Hz. Water cooled SS to 5kHz, 4-10kHz or 10-20kHz

Wavelength	**fixed selectable from: 750 to 1000nm**

Model	**DS-OPO (DP-OPO)**
Pulse energy*	up to 2mJ @ 1kHz (up to 2mJ @ 100Hz aircooled)
Pulse Width (nominal)	6-15ns
Repetition Rate	Aircooled SS to 100Hz. Water cooled SS to 5kHz, 4-10kHz or 10-20kHz

Wavelengths	**available in the visible: 400 to 700nm**

Model	**DSH-671-3**
Wavelength	671nm
Pulse Energy @ 10kHz	300uJ
Repetition Rate	Single shot to 10 kHz

Model	**DP20-527**	**DP5-527**	**DP1-527**
Wavelength		527nm	
Pulse Energy @ 100Hz	18mJ	4mJ	1.2mJ
Pulse Width @ 100Hz (nominal)	~7ns	~4ns	
		air-cooled	

Model	**DS-OPO (DP-OPO)**
Wavelength	fixed selectable from: 500 to 667nm**
Pulse energy*	up to 800uJ @ 1kHz (up to 800uJ @ 100Hz aircooled)
Pulse Width (nominal)	10-15ns
Repetition Rate	Aircooled SS to 100Hz. Water cooled SS to 5kHz, 4-10kHz or 10-20kHz

* higher pulse energies may be available. Please contact the factory
** shorter wavelengths (down to ~250nm) available. Please contact the factory

Common specs	
Beam Mode	TEM00
Beam Diameter @ exit (nominal)	0.7 to 1mm
Pulse to Pulse Stability	+/- 3% rms
Electrical Requirement	110 VAC 20 Amps or 220 VAC 10 Amps @ 50/60 Hz
Ambient Temperature	15 to 30°C (59 to 86°F) Operating Range

Wavelengths **tunable over: 720-940 nm**

Model	**TU-L**	**TU-H**
Pulse Energy @ 1kHz	1mJ @ 1kHz	250uJ @ 4kHz
Pulse Width @ 1kHz (nominal)	10-35 ns	30-50 ns
Repetition Rate	Single shot to 4kHz	4kHz to 10kHz
Spatial Mode Profile	TEM_{00}	
Energy Stability (P to P)*	2% rms	
Line Width (in fundamental)	0.1 cm^-1	
Cooling	closed loop chiller	
Electrical Requirement	110 VAC 20 Amps or 220 VAC 10 Amps @ 50/60 Hz	
Ambient Temperature	15 to 30 °C (59 to 86 °F) Operating Range	

*For fundamental wavelengths.

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