Subnanosecond Actively Q-Switched Solid-State Lasers

PULSELAS®-A Series

A wide range of diode-pumped actively Q-switched lasers with pulse durations around 1 ns are offered by ALPHALAS. They feature high peak powers at various wavelengths in the infrared, visible and ultraviolet as well as excellent TEM_{00} beam profile.

The PULSELAS®-A series lasers implement proprietary Pockels cell design for generating extremely short laser pulses. The semi-monolithic laser cavity is permanently aligned and therefore extremely stable.

The multi-kilowatt laser pulses can be as short as 500 ps and have a jitter to external signal of typically 500 ps, with option down to 200 ps.

High-energy amplified laser systems (MOPA) deliver more than 1 mJ pulses resulting in the highest peak power >1 MW with pulse widths below 1 nanosecond.

Models with repetition rates from 10 kHz up to 100 kHz and average power ranging from 100 mW to >1 W are available.

The standard models with wavelengths 1047, 1053, 1062 and 1064 nm are complemented by lasers operating at 946 and 1342 nm with pulse durations <5 ns. Optional frequency conversion to red (671 nm), green (532 nm), blue (473 nm) and ultraviolet (355 nm or 266 nm) is also available.

The compact design is perfectly suited for almost any system integration.

These unique lasers have an extremely broad spectrum of applications ranging from supercontinuum generation in photonic crystal fibers to laser-induced breakdown spectroscopy.

Features

- Actively Q-Switched
- Extremely Compact
- Proprietary Electro-Optic Miniature Q-Switch Design
- Subnanosecond Pulses at 1047, 1053, 1062 and 1064 nm
- Extremely Low Jitter (typ. <500 ps, optional 200 ps rms)
- Pulse Energies up to 100 µJ (1 mJ with MOPA)
- Peak Powers up to 150 kW
- Repetition Rates up to 100 kHz
- Average Powers above 1 W
- Frequency Conversion to 266, 355, 473, 532 and 671 nm (Option)

Applications

- Material Processing
- Micromachining
- Marking & Cutting of Extremely Hard Materials (e.g. Diamonds)
- Nonlinear Optics
- Supercontinuum Generation
- Time-Resolved Fluorescence Measurements
- DNA-Analysis
- LIDAR & Laser Ranging
- Pollution Monitoring
- Laser-Induced Breakdown-Spectroscopy (LIBS)
- Ignition of Explosives, Combustion Machines & Gas Mixtures

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PULSELAS®-A Series • Actively Q-Switched Lasers @ 1064 nm

Model	PULSELAS-A-1064-300	PULSELAS-A-1064-500	PULSELAS-A-1064-600-HP	PULSELAS-A-1064-1000-HP [1)]
Wavelength (nm)	1064	1064	1064	1064
Energy / Pulse (µJ, typ.)	20 @ 1 kHz	40 @ 1 kHz	50 @ 1 kHz	100 @ 1 kHz
Average Power (mW) @ Max. Rep. Rate	typ. 300 @ 20 kHz	typ. 500 @ 25 kHz	typ. 600 @ 25 kHz	typ. 700 @ 10 kHz
Pulse Width (ns)	0.7 - 1.0	1.0 - 1.5	1.5 - 2.0	1.5 - 3.0
Repetition Rate (kHz)	0 - 20	0 - 25	0 - 25	0 - 10
Beam Profile	TEM_{00}	TEM_{00}	TEM_{00}	TEM_{00}
Polarization Ratio	> 100:1	> 100:1	> 100:1	> 100:1
Beam Diameter (mm)	0.3	0.3	0.3	0.3
Beam Divergence (mrad Full Angle)	typ. 3	typ. 3	typ. 3	typ. 3
Power Instability (% rms, 1 hour)	< 3	< 3	< 3	< 3
Heatsink Operating Temperature (°C)	+18° ... +30°	+18° ... +30°	+18° ... +30°	+18° ... +30°
Laser Head Dimensions (W×H×L, mm^3)	40×52×140	40×52×140	40×52×140	60×70×180
Included LD & TEC Driver (W×H×L, mm^3)	LDD1-1T-D 105×65×100	LDD1-1T-D 105×65×100	LDD1-1T-D 105×65×200	LDD1-1T-F 105×65×200
Pockels Cell Driver (W×H×L, mm^3)	PCD-1002 105×44×100	PCD-1002 105×44×100	PCD-1002 105×44×100	PCD-1002 105×44×100
Operating Temperature (°C)	+18° ... +30°	+18° ... +30°	+18° ... +30°	+18° ... +30°
Storage Temperature Without Humidity (°C)	-10° ... +50°	-10° ... +50°	-10° ... +50°	-10° ... +50°

Notes:

[1)] Fiber-pumped laser head.

A built-in frequency generator and external TTL triggering are standard features for all models.

All models are available with options for frequency doubling, tripling and quadrupling to 532, 355 and 266 nm.

Customer specific parameters are available upon request. Please contact us for further information. Specifications for customer specific products are subject to change.

Regulatory Requirements Compliance

The PULSELAS® series diode-pumped solid-state lasers are OEM products intended for integration into other systems. They do not comply with CDRH requirements. The customer is responsible for CDRH certification of the system incorporating the PULSELAS® lasers.

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