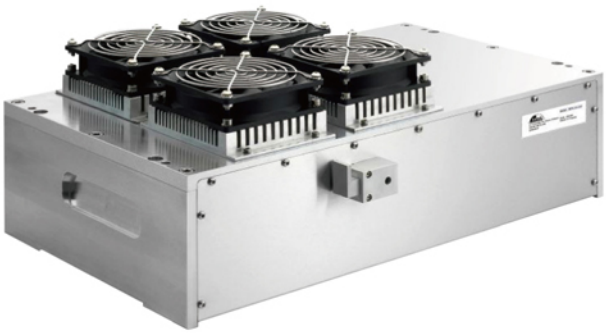
方全有限公司
Rapitech Enterprise Co.,Ltd.

脈衝式固態雷射
Pulsed Solid-State Laser



PicoSpark™系列脈衝雷射

PicoSpark™: Fiber Amplified, Picosecond Microchip Lasers

Applications

- Micromachining
  - Scribing silicon and sapphire
  - Edge isolation
  - Drilling in steel
  - Ablation of copper
  - Cutting of tungsten
- Biophotonics
  - Microsurgery
  - Dense tissue ablation
  - Tattoo removal
- Instrumentation
  - Laser Induced Breakdown Spectroscopy
  - Raman spectroscopy Supercontinuum generation
  - Ranging
  - Differential absorption LIDAR
- Marking
  - Glass inscribing
  - Diamond graphitization

PicoSpark™ brings together Passively Q-Switched (PQS) microchip laser technology with fiber amplification, resulting in a multiwatt laser that generates pulses with hundreds of kilowatt peak power and hundreds of gigawatt per square centimeter irradiance.
A PQS microchip laser is the seed of PicoSpark™ and sets the pulse width in the hundreds of picoseconds; a fiber amplifier provides the gain, compactly and efficiently. This Master Oscillator Fiber Amplifier (MOFA) architecture enables a constant pulse width, while allowing the user to vary the pulse energy (or peak power) and the repetition rate independently of each other. The output is freespace coupled, preserving peak power and beam quality.
The Picospark™ HNP series emits 5.5W at 1064nm; the HNG series emits 3.5W at 532nm, generated by harmonic conversion, both with an M^2 of 1.4 or lower.

PicoSpark. HNx lasers

Model	HNP-05P-100	HNG-03P-100
Wavelength (nm)	1064	532
M^2	1.3	1.3
Energy/Pulse (μJ)	200	100
Pulse Width (ps)	900	600
Peak Power (kW)	220	170
Repetition rate (kHz)	20-40	20-40
Average Power (W)	5.5	3

Optional features

- Increased pulse energy
  - by relaxing M^2 or, at 1064nm, by removing isolator

Features & benefits

Ultrashort pulses that stay constant while varying rep rate or pulse energy
As low as 600ps duration at 532nm, 900ps at 1064nm

High peak power
125kW per pulse, with 550GW/cm² irradiance, at 532nm; 250kW per pulse, with 700GW/cm² irradiance, at 1064nm

Variable Repetition rate
Adjustable from 20kHz to 40kHz

Adjustable pulse energy
Pulse energy turned on in <300μs, turned off in <600μs

Excellent beam quality
Gaussian, TEM00, M^2.1.4

Efficient, air cooled
Typically consumes <350W

Licensed Technology
Exclusive license on Passively Q-switched picosecond microchip lasers: US Patent 5394413
License on fiber lasers and amplifiers: US Patent 5818630

CDRH compliant

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