

Solid-State Laser Diode



Overview

Solid state are typically, using either a or, or by. tend to be much more efficient and have become much more common as the cost of high-power has decreased.

AI Overview

Solid-state laser diodes are semiconductor devices used to pump solid-state gain media, enabling compact, efficient, and high-quality laser output. Overview Solid-state lasers use a solid gain medium, typically a crystal or glass doped with rare-earth ions such as neodymium, ytterbium, or erbium, to generate laser light. When these media are excited, they store energy that can be released as coherent light. Laser diodes serve as the energy source in modern systems, replacing older flashlamp pumping methods, which were less efficient and generated excessive heat. Diode-Pumped Solid-State Lasers (DPSS) A diode-pumped solid-state laser (DPSSL) uses a laser diode to excite the solid gain medium, such as Nd:YAG or Nd:YVO₄. The diode emits light at a wavelength matched to the absorption peak of the crystal (e.g., 808 nm for Nd:YAG), which is absorbed by the dopant ions, raising electrons to higher energy levels. When these electrons relax, they emit laser light at a characteristic wavelength (e.g., 1064 nm for Nd:YAG). DPSS lasers offer several advantages over direct diode lasers: Higher beam quality: The output beam is often single-mode with low divergence. Higher peak power: Suitable for pulsed operation, Q-switching, and ultrafast pulses. Compact and efficient: Diode pumping reduces wasted energy and thermal effects compared to flashlamps. Laser Diodes as Pump Sources Laser diodes themselves are semiconductor devices that emit light when an electrical current passes through them. They can be configured as single emitters, bars, or stacks to provide higher pump power for solid-state lasers. Diode arrays are often collimated and focused onto the gain medium to maximize absorption and efficiency. Wavelengths...

Article Content

Diode Pumped Solid State Laser

Diode-pumped solid-state lasers (DPSSL) are defined as lasers that utilize direct laser-diode pumping of solid-state materials, which enhances efficiency, simplicity, compactness, reliability, and cost

Eachwave Colibri-532(1064) All-Solid-State Diode-Pumped Compact

The Eachwave Colibri-532 (1064) is an all-solid-state, diode-pumped, compact sub-nanosecond laser engineered for high-reliability integration into OEM instrumentation and laboratory-grade optical

Quantel/Lumibird Centurion + Diode Pumped Solid State Laser (50mJ)

The Centurion + is an air cooled, diode pumped laser, delivering 50 mJ energy in nanosecond pulses at repetition rates up to 100 Hz. Diode pumping eliminates the need of water, reduces size, improves

TESTED BLM-100 450nm Wavelength Laser Head

Tested BLM-100 450nm Wavelength Laser w/ DPSSL Driver Power Supply
Optoelectronic Tech MBL IPG Photonics Used See Photos. Diode-Pumped Solid

Understanding the Structure of Solid-State Lasers and

Explore the structure of solid-state lasers, the role of diode pump sources, and how pump specifications like wavelength and power affect laser

Ultrastable high power laser diode drivers uniLDD

Ultra-stable and high power laser diode drivers with internal TEC controller option
Laser diode drivers, also known as laser diode controllers, for pumping of diode

Home | Hamamatsu Photonics

The official website of Hamamatsu Corporation whose mission is to advance science and industry through photonic technologies. Our products include optical sensors

Diode-pumped Lasers – DPSS lasers, diode pumping,

Low-power lasers (up to roughly 200 mW) can be pumped with small edge-emitting laser diodes. These exhibit an essentially diffraction-limited beam quality and

Coherent AVIA NX Diode Pumped Solid State Q-switched Lasers

AVIA NX is a diode-pumped, solid-state, Q-switched laser offered at 532 nm and 355 nm. The AVIA NX family delivers the highest power on the market, in a small lightweight package. Available at several

Solid-state Lasers – diode-pumped, lamp-pumped, DPSS laser, doped ...

A DPSS laser is a diode-pumped solid-state laser. It uses highly efficient laser diodes as the pump source, which results in a compact setup, long lifetime, and often excellent beam quality.

How a Diode Pumped Solid State Laser Works

Explore the technology that powers modern solid-state lasers, from efficient diode pumping to achieving visible colors.

Novel High-Power, High Repetition Rate Laser Diode Pump Modules ...

The latest generation of high-energy-class pulsed laser facilities, under construction or planned, such as EuPRAXIA, require reliable pump sources with high power (many kW), brightness ($>1 \text{ MW/cm}^2/\text{sr}$)

Nichia NUBM44 450nm 6W 9mm Blue Laser Diode

BeamQ Laser Nichia NUBM44 450nm 6W 9mm Blue Laser Diode - Nichia NUBM44 450nm 6W 9mm Brand New NUBM44 is a 445nm laser diode that emits 6W of

OBIS LS/LX

OBIS LS/LX are the original compact smart lasers, offering plug-and-play simplicity with over 30 wavelengths from the UV to near-IR plus optional fiber delivery.

Eachwave SUB50A-700 Diode-Pumped Solid-State (DPSS) Sub

Overview The Eachwave SUB50A-700 is a compact, air-cooled, diode-pumped solid-state (DPSS) sub-nanosecond laser system engineered for high-precision scientific and industrial applications requiring

United States Medical Lasers Market Report 2026

The United States medical lasers market is a highly advanced and dominant sector characterized by a robust research ecosystem and a strong preference for minimally invasive

Solid-State Laser

All solid state lasers have become possible by the arrival of reliable high power diodes; this did not only lead to a considerable improvement of the existing solid state laser technologies, but

List of laser types

This is a list of laser types, their operational wavelengths, and their applications. Thousands of kinds of laser are known, but most of them are used only for specialized research.

Solid-state laser

Solid state lasing media are typically optically pumped, using either a flashlamp or arc lamp, or by laser diodes. Diode-pumped solid-state lasers tend to be much more efficient and have become much more common as the cost of high-power semiconductor lasers has decreased.

Laser Diodes and Pump Modules

Laser diode bars are well suited for pumping solid state lasers for industrial, additive manufacturing and scientific applications. Diode bars are available unmounted

Diode-Pumped Lasers: Performance, Reliability

The latest technology advances take diode-pumped solid-state lasers into new realms of power and wavelength, enabling many new applications.

DPSS Green Laser

Sprout, a compact diode-pumped solid-state (DPSS) laser launched by Lighthouse Photonics LLC, features noise elimination technology and is available in four versions ranging from 5 to 10 W. Suited

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.tomor.eu>

Email: info@tomor.eu

Phone: +49 69 2381 5497

Address: Am Hauptbahnhof 10, 60329 Frankfurt am Main, Germany

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