High-frequency laser diode

AI Overview

High-frequency laser diodes are semiconductor devices capable of generating nanosecond to sub-nanosecond optical pulses at repetition rates up to tens of MHz, used in applications like LiDAR, fiber laser pumping, and high-speed sensing.OverviewA laser diode is a semiconductor device that emits coherent light when electrically pumped, similar to a light-emitting diode but capable of stimulated emission at the p–n junction . High-frequency laser diodes are designed to operate at rapid pulse rates, often in the nanosecond range, with repetition rates reaching 10 MHz or higher . These diodes can produce high peak powers, sometimes exceeding 100 W, while maintaining short pulse durations for precise timing and high-resolution measurements .Key CharacteristicsPulse Duration: Typically 1–100 ns, adjustable depending on the driver circuit and application .Peak Power: Can range from tens to hundreds of watts, with some pulsed diodes reaching 350 W in nanosecond pulses .Wavelength Range: Commonly from 405 nm to 1470 nm, with specific wavelengths optimized for LiDAR (e.g., 905 nm, 940 nm, 1470 nm) or fiber laser pumping .Driver Circuits: High-frequency operation requires specialized drivers, such as D-mode GaN HEMT circuits, which allow fast turn-on/off times and high efficiency (up to 86% power-to-light conversion), .Beam Delivery: Often fiber-coupled with core diameters from 62.5 µm to 200 µm, enabling precise optical alignment and integration into systems .ApplicationsLiDAR and Autonomous Vehicles: High-frequency pulsed diodes enable accurate distance measurement and high-resolution mapping by sending short, high-power pulses and measuring time-of-flight .Fiber Laser Pumping: High-power diodes pump solid-state or fiber lasers efficiently, supporting industrial and scientific laser systems .Materials Processing and Medical Applications: Short, high-intensity pulses allow precise cutting, welding, or medical imaging .Scientific Research: Used in spectroscopy, time-resolved measurements, and synchronization experiments requi...

Article Content

Linear frequency swept laser source with high swept slope based on ...

Experimentally, we achieve a frequency swept bandwidth of 31.1 GHz with a frequency swept slope of 518 THz/s using a distributed feedback laser diode (DFB-LD).

Laser Diodes and Pump Modules

From our vertically integrated laser diode manufacturing location in New Jersey, USA, we supply the pump diodes for all TRUMPF Group lasers including TruDisk, TruFiber and TruMicro lasers, and to

Photodigm | High-Performance DBR Laser Diodes

Photodigm designs, tests, and manufactures high-performance DBR laser diodes from 730–1090 nm for precision applications including spectroscopy, sensing, biomedical, and quantum systems.

High-Frequency Pulsed Laser Driver Using Complementary GaN HEMTs

This article attempts to disclose a high-efficiency laser driver that controls laser sources for high-frequency light detection and ranging (LiDAR) applications.

Wuhan Raycus Fiber Laser Technologies Co., Ltd.

About Raycus Wuhan Raycus Fiber Laser Technologies Co., Ltd. (hereinafter referred to as "Wuhan Raycus") is the first Chinese enterprise engaged in the

Laser Diode Drivers

We offer pulsed diode drivers for pumping different types of diode-pumped solid-state lasers based on crystal (Nd:YAG and similar lasers), microchip, fiber, or

High-Frequency Diode Laser Driver

The unit can operate at duty cycles up to 40%, and is optimized for range finder, LIDAR, illumination and other pulsed laser diode applications requiring high-speed, high-power pulsed output.

High-repetition-frequency high-power pulsed laser diode driver

Here we propose a high-repetition-frequency high-power pulse power supply for laser diode driving by using frequency synthesis technique. This technique generates a high repetition

Design of High Peak Power Pulsed Laser Diode Driver

A design guide is summarized from the derivations and analysis of the proposed laser diode driver. According to the design guide, we selected the capacitor, resistor, and diode

High-frequency ultrasound array element using therm... | PDF or Rental

The thermoelastic effect was used to produce high-frequency, broadband ultrasound in water. A pulsed diode laser, followed by an erbium-doped fiber amplifier, was focused onto a light-absorbing film

High Power Lasers Diodes (10W ~ 1kW)

Common uses of high power laser diodes include the pumping of the gain medium in solid state lasers, fiber laser pumping and seeding, materials processing,

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Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

Microring-Based Microwave Generation: Experimental Comparison of

Abstract: The self-injection locking (SIL) of a laser diode frequency to a eigenfrequency of a high- Q microresonator is a powerful tool for robust and stable photonic systems. The advances in integrated

Laser Diodes – semiconductor, gain, index guiding, high

The article details the many types, from small edge-emitting and surface-emitting diodes (VCSELs) to single-frequency lasers like DFB and DBR lasers, external

Laser Diodes | Components to Systems | UV-LWIR

Our vast selection of laser diodes includes both free-space & fiber-coupled outputs, like high-power Fiber-Coupled Multimode, high beam quality single mode, and

Laser Precision and Frequency Control for Consistent Engraving

What makers really want from laser optimization Someone searching for a manual on optical-grade precision, frequency modulation, and batch consistency is usually not a total beginner. The typical

MOPA Fiber Laser | JPT MOPA Laser Source & Engraver-JPT Laser

JPT MOPA fiber lasers provide adjustable pulse width and frequency for high peak power and flexible processing. Designed for precision marking, color marking, deep engraving, and micromachining

A Combined Injectable and Fractional 1470 nm Laser Approach for

This prospective single-arm case series evaluated the safety and high-frequency ultrasound-assessed morphological changes in a combined protocol integrating subcision, PEGDE

High power pulsed laser diode up to 350 W nanosecond pulses

This high power pulse laser diode generates nanosecond range optical pulses out of a multimode fiber. It includes a synchronization tool to

Evolase PLD-PS Compact Short-Pulse Laser Diode Driver

Overview The Evolase PLD-PS is a compact, high-performance short-pulse laser diode driver engineered for precision seeding applications in ultrafast optical systems.

Design of High Current Nanosecond Resonant Pulse Drivers for Laser ...

While this article will focus on laser diode drivers for lidar applications, the design methods are suitable for any application where high current nanosecond pulses are needed.

DFB LASERS

High Power 1550nm DFB Laser Diode, 200mW / 300mW (CW / Pulsed), Single Frequency, Narrow Spectral Linewidth High power 1550nm DFB laser / single frequency & single mode

Second-harmonic generation

Second-harmonic generation (SHG), also known as frequency doubling, is the lowest-order wave-wave nonlinear interaction that occurs in various systems,

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.

Contact Us

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