

Pulsed Laser Diode Applications



AI Overview

Pulsed laser diodes are used in industrial, medical, automotive, and scientific applications where high-intensity, short-duration light pulses are required. Industrial Applications Pulsed laser diodes are widely used in industrial laser marking, safety scanners, and automation systems. In safety applications, they create a curtain of laser light detected by sensitive avalanche photodiodes (APDs) to monitor the presence of objects or personnel in hazardous areas, such as automated production lines, ensuring workplace safety. In industrial automation and robotics, pulsed laser diodes enable time-of-flight (ToF) measurements for precise distance, position, and movement detection, supporting navigation and gesture control. Automotive and Lidar Systems In automotive and autonomous vehicle technologies, pulsed laser diodes are essential for Lidar (Light Detection and Ranging) systems. These systems emit short laser pulses and measure the reflected light to generate 3D images of the environment, enabling collision avoidance, navigation, and advanced driver-assistance systems (ADAS). High-current nanosecond pulse drivers allow these diodes to operate at tens to hundreds of amperes with extremely fast rise and fall times, making cost-effective, compact Lidar systems feasible. Medical and Biomedical Applications Pulsed laser diodes are extensively used in medical diagnostics, imaging, and therapeutic procedures. Applications include photoacoustic imaging, optical coherence tomography, fluorescence lifetime imaging, cancer therapy, laser acupuncture, and cosmetic dermatology. Their ability to deliver high-power, short-duration pulses allows precise targeting of tissues and chromophores while minimizing thermal damage. Advances in semiconductor diode technology have made these devices portable, low-cost, and highly efficient, suitable for both clinical and research environments. Scientific and Measurement Applications In scientific research, pulsed laser diodes are used for high-speed optical measurements, spectr...

Article Content

Laser Engineering Company

Due to an extensive know-how in key laser technologies developed by our engineering and scientific team, Evolase offers customized design of the laser sources, which fit best to the customers most

Pulsed Laser Diodes & Arrays

Our Pulsed laser diodes are used in several demanding applications, including light detection and ranging (LiDAR), range finders, safety light curtains, adaptive

A SiC Based Two-Stage Pulsed Power Converter System for Laser

Abstract: High-power laser diodes (LDs) are used in various military, medical, and industrial applications. In this article, the unique driving requirements of a high power pulsed LD

BVLASER-Global Leading Medical Aesthetic Laser Manufacturer

BVLASER is a leading world-class manufacturer of medical aesthetic laser equipment that provides ODM& OEM services, with high-end recognized technologies as diode laser, CO2 laser, picosecond

Operating Edge-Emitting Pulsed Laser Diodes with Short Pulses

Many existing and emerging applications for Edge-Emitting Pulsed Laser Diodes (hereafter referred to as simply PLDs) require operation of the devices with narrow pulse widths.

Pulsed Lasers – pulse-generating lasers

Innolume's pulsed laser diodes provide precision-tailored light sources for time-critical photonic applications. We offer both Fabry-Pérot (FP) and Distributed

Pulsed Laser Diodes

The ability of pulsed laser diodes to provide short pulses of intense power has made them an ideal choice for military applications such as target designating and rangefinding.

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

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Pulsed Fiber Laser Connet pulse fiber laser technology platform includes direct modulation to generate nanosecond pulses, and external modulators to generate

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.

APPLICATION DEVELOPMENT WITH PULSED LASER DIODES

The prime example of pulsed laser applications is time-of-flight (ToF) measurement for unambiguous optical distance measurement. Advanced laser diodes and driver electronics enable small, long

Sales Projections and Analysis in the Laser Diodes and Direct Diode ...

The Laser Diodes and Direct Diode Lasers market is experiencing robust growth across North America, driven by advancements in telecommunications, medical devices, and industrial

Diode Laser vs IPL vs Alexandrite: Complete Technology Comparison

Diode laser vs IPL vs Alexandrite — objective technology comparison for clinic buyers. Covers wavelength efficacy by skin type, treatment sessions, machine cost from \$2,000-\$15,000,

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

High Output Laser Diodes

High Output Laser Diodes Infrared high-power lasers deliver high peak output with pulse lighting, making them ideal for use as light sources for distance measurement.

North America 1030nm Laser Market By Type 2031

Continuous Wave (CW) Lasers Pulsed Lasers Mode-Locked Lasers Diode Lasers Fiber Lasers The North America 1030nm Laser Market is segmented into various types, each catering to

QSL Series Passively Q-Switched DPSS UV Lasers

The QSL Series is a family of ultraviolet diode-pumped solid-state (DPSS) passively Q-switched lasers delivering average output powers up to 30mW. Available at 266nm and 355nm wavelengths, these

Design of Nanosecond Pulse Laser Diode Array Driver Circuit for

This article proposes a nanosecond-level pulsed laser diode array drive circuit to address the laser drive issue at the laser emission end of a solid-state LiDAR.

Foresight HSLS High-Speed Imaging Pulsed Laser Illumination Source

Overview The Foresight HSLS High-Speed Imaging Pulsed Laser Illumination Source is an engineered optical tool designed to deliver precisely timed, high-intensity laser pulses for synchronization with

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

PCO-6131 Pulsed/CW Laser Diode Driver Module

Berkeley Nucleonics PCO-6131 OEM laser diode driver module gives adjustable pulse rise time from under 30 ns to 2.5 us for diode loads. See specs and options.

Contact Us

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