

High Precision Laser Diode



AI Overview

High precision laser diodes offer narrow linewidth, stable wavelength, and high reliability for applications in spectroscopy, quantum research, sensing, and advanced optical systems. Overview High precision laser diodes are designed to deliver exceptional wavelength control, narrow spectral linewidths, and stable output power, making them ideal for applications requiring high accuracy and repeatability. These diodes often employ distributed feedback (DFB) or single-frequency designs, which ensure single transverse-mode operation and minimal wavelength drift, even under varying temperature conditions. Typical power levels range from tens of milliwatts to several watts, depending on the application and diode type. Key Features Wavelength Stability: Many high precision diodes use volume Bragg gratings (VBG) or monolithic DFB structures to stabilize the emission wavelength with precision down to ± 0.5 nm and reduce temperature sensitivity to approximately 0.01 nm/ $^{\circ}\text{C}$. Narrow Linewidth: Single-frequency operation ensures narrow spectral linewidths, which is critical for spectroscopy, holography, and quantum optics. High Reliability: Hermetically sealed housings and advanced thermal management, such as aluminum nitride carriers with gold-tin bonding, protect the diode from environmental influences and maintain consistent performance. Flexible Integration: Available as chips, submounts, or complete modules, these diodes can be integrated into complex optical systems, fiber-coupled setups, or automated laser machines. Applications High precision laser diodes are widely used in: Spectroscopy and Sensing: For detecting chemical compositions, gases, or biological samples with high accuracy. Quantum Research: Single-frequency diodes provide stable light sources for quantum computing experiments and quantum communication systems. Materials Processing: High-power variants enable precise cutting, welding, or marking of materials with minimal thermal impact. LiDAR and Ranging: Fiber-coupled diodes with controlled beam qua...

Article Content

Laser Diode Drivers

Laser Diode Drivers (OEMOD-LDD Series): These are dedicated, high-precision current sources that range from low-current OEM models (down to 150 mA) up to high-power, fully programmable

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,

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.

Laser Diodes – semiconductor, gain, index guiding, high

Such packages are widely used for telecommunication-grade DFB and DBR diodes, precision pump lasers and other high-stability sources. Inside such a package,

High Power Laser Diodes

Our products are, therefore, the first choice in edge emitting high power laser diodes, which are assembled on C mounts, in TO housings, and HHL housings.

Desktop CNC Router Starter Kit Guide: Hybrid Versatility Maximize

Master desktop CNC router starter kits. Learn how to combine high-torque spindles with precision laser modules for safe, high-efficiency workshop production.

EEL M12 650nm Laser Diode AL52010001

The EEL M12 650nm Laser Diode is engineered for high precision and stable optical power output, featuring excellent heat dissipation and an integrated APC (Automatic Power Control) circuit.

Global GaN Laser Diodes Market Size, Industry Share, Trends

The European GaN laser diodes market benefits from a strong emphasis on innovation, sustainability, and high-precision manufacturing, with key contributions from Germany, France, and

Gan Laser Diode Market in the Netherlands | Report

The Netherlands GaN laser diode market operates within one of Europe's most concentrated electronics and photonics ecosystems. The country's position as a demand center and

High-Precision Laser Diodes

A laser diode with precision and stability is here. See how this innovation could impact your spectroscopy, quantum research, and more work.

Laser Diodes and Pump Modules

Whether it is diodes for extremely high reliability applications such as LiDAR pumping or high-power pump modules for industrial and security applications, or customized laser diodes for scientific

High Power Diode Lasers | Kilowatt-Level Semiconductor Lasers -

Discover Vivlaser high-power diode lasers with stable output, excellent thermal management, and power up to kilowatt level for industrial and medical applications.

Laser Diodes

Cutting Edge Optronics offers high-power laser diode bars and arrays at standard and custom pump wavelengths to support industrial, medical, and defense DPSS

ETSC LCM-6200 Benchtop Semiconductor Laser Diode Controller

Overview The ETSC LCM-6200 is a high-precision benchtop semiconductor laser diode controller engineered for demanding laboratory and industrial applications requiring simultaneous, independent

Best Laser Cutters and Engravers for Schools | Top 5

Best for Precision and Versatility: HeatSign 5W JPT UV Laser Engraving Machine
Looking for a compact, high-precision laser that fits right into a modern

Ortur Laser Master 3 (LM3) Laser Engraver & Cutter 10W/20W/40W

Ortur Laser Master 3 (LM3) provides powerful 10W, 20W, and 40W laser engraving and cutting with high precision and speed for versatile

Laser Diode chips

Discover the industry-leading reliability and performance of TRUMPF's laser diode chips. We offer laser diodes to meet your specific needs. A high-quality product and unmatched customer service is

Arroyo Instruments

Arroyo Instruments is a laser diode driver and temperature controller manufacturer offering incredibly precise instruments for use in a variety of applications.

High Power Laser Diodes

With a commitment to quality, reliability, and performance, we deliver laser diodes engineered to meet the rigorous demands of both defense and commercial applications.

Best laser engravers of 2026 | Tested for speed & precision

I reviewed the best laser engraving machines for precision, speed, and performance in the home, studio, or workshop. These are my top recommendations.

Femtosecond Lasers – ultrashort pulses, mode-locked lasers,

Femtosecond lasers are lasers emitting light pulses with durations between a few femtoseconds and hundreds of femtoseconds.

Your solution for laser diodes and photonics systems | AeroDIODE

AeroDIODE offers photonics solutions: precision & short pulse laser diode drivers, fiber modulators, synchronization electronics, laser diode sources.

Laser Diode Driver

CW laser diode drivers are used to precisely control a laser diode's optical output while protecting the laser diode from over current conditions. Multiple levels of laser diode protection are included in the

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