

Custom Process for Integrated Laser Diodes



AI Overview

Integrated laser diodes can be custom-fabricated using etched-facet techniques, precision packaging, and tailored optical and electronic integration for specific applications. Custom integrated laser diodes often start with a semiconductor epi-wafer, where the active region is grown using materials such as GaN or InGaN for visible and UV wavelengths. A key step in integration is the formation of laser facets, which can be achieved through a combination of dry and wet etching. For example, a two-step process using inductively coupled plasma reactive ion etching (ICP-RIE) followed by wet etching in tetramethylammonium hydroxide (TMAH) allows precise control of facet geometry and surface quality, enabling short-cavity lasers and on-chip integration with photonic circuits. Optimizing etching parameters, such as TMAH temperature and etch time, ensures threshold currents comparable to cleaved reference devices.

Optical and Electronic Integration After fabrication, the laser diode is optically shaped and packaged. Collimating lenses and optical elements are used to align and stabilize the beam, improving beam quality and facilitating integration into complex systems. Electronics play a critical role: custom drivers provide stable power and allow precise modulation, which is essential for industrial, laboratory, or OEM applications. Frequency-stabilized modules, such as those with integrated vapor cells, can lock to atomic references for metrology or quantum applications.

Packaging and Module Design Custom laser diode modules are typically hermetically sealed and thermally stabilized, often in industry-standard packages like butterfly or FLAME modules. These packages support single-mode chips across multiple wavelengths and allow defined optical, electrical, thermal, and mechanical performance. Packaging also en...

Article Content

How Customized Laser Diode Modules Add Value Across Your

In this whitepaper, we explain how custom laser diode module solutions can provide OEMs with the application-specific performance they require while delivering a cost-effective and value-added solution.

Custom Fiber-Coupled Laser Diodes for Dental OEM

Discover how a custom fiber-coupled laser diode for dental OEM systems enhances precision in periodontal and surgical procedures.

Custom Development of Laser Sources

If you have not found a laser source, which matches your requirements, but you think it is potentially achievable with our platforms (direct diode, tapered amplifiers, DPSS, passive Q-Switch, fiber

Article: Guide To Custom High Power Laser Diodes

You are designing a product that incorporates a high power laser diode. The first question to ask is, "Do I need a custom design?" Beyond that, you need to understand the costs and technical issues

Custom Laser Diodes | Cost-effective Custom Diode

Need a specific emitter width, cavity length, or performance? We can process a custom chip design to meet your requirements. Tell us what you need! Let Us

Laser Diodes

High power laser diodes for custom for specialized application requirements.

#TailoredLaser | Modulight

With our state-of-the-art, vertically integrated foundry, we can customize solutions at the semiconductor level, delivering capabilities that surpass standard off-the-shelf technology. From Proof of Concept

Bambu Lab H2D Review: 3D Print · Laser Engrave ·

The H2D's 40W diode laser is competitive with dedicated 40W desktop diode laser engravers — similar cutting depth (15mm wood), similar

Top laser engraver with integrated fast auto-focus system

For most makers, the top laser engraver with integrated fast auto-focus system is one that can reliably find focus in one to three seconds, repeat that focus within about 0.1 mm, and do it

GaAs nano-ridge laser diodes fully fabricated in a 300

A new integration approach, nano-ridge engineering, enables electrically driven GaAs-based laser diodes to be fabricated on Si wafers in a

Custom Diode Laser | Tailor-made laser solutions ✂ Inquire now !

Contact our engineering team to evaluate the appropriate Single frequency laser solution for spectroscopy, metrology or OEM integration. Careful parameter selection and coordinated

Custom Laser Diodes | Cost-effective Custom Diode

Our Process Define Your Requirements With nearly 30 years of experience providing the right laser at the best price, RPMC has the partnerships & technical

Communication Components and High Power Lasers

Custom & OEM Solutions By leveraging our core expertise in optoelectronics technology and global manufacturing presence, OSI Laser Diode, Inc. (LDI), leads the industry in providing the best, and

Custom Laser Diode Module | Photonics Design | World

Custom laser diode module designs for precision and tailored solutions. Explore innovative options for your specific needs.

Custom Laser Diode Products for Enhanced Performance

Custom laser diode products can be designed to deliver high power outputs, enabling applications such as cutting, welding, material processing, and

Laser diode modules

ALTER's laser diode modules: Custom configurations, in-house assembly/testing, and precision solutions for diverse Photonics applications. As the practical

Lasers | TRUMPF

This ensures maximum precision, efficiency and process reliability – for cutting, welding, marking or surface processing. Rely on laser systems that integrate

T05-9mm Laser Diode Module Universal Housing Case Heatsink Set

By integrating the diode, housing, and heatsink into a single, C-mount compatible unit, it addresses the most common pain points associated with laser diode usage: thermal instability, compatibility issues,

Diode laser – A complete guide to precise laser work

Diode Lasers: The Guide to Precision Marking, Engraving and Cutting This complete guide covers the fundamentals of diode laser technology, their practical capabilities and limitations, and how to

Customized Packages

Co-packaging of laser diodes, PICs, SOAs, photodiodes, filters, and modulators into customized optoelectronic engines. See our customized packages.

Laser Diodes and Modules

Product Portfolio AMS Technologies is a leading supplier of laser diodes and carries an exceptionally broad portfolio of component-style laser diodes as well as laser

Customized Diode Laser Modules

Diffraction optical elements (DOE) can be integrated in customized diode laser modules. A wide range of different patterns like multi lines, dot lines, crosshair, circles, dot matrix and random patterns are

Laser diode modules

With a long history as a packaging company, ALTER has the advantage of in-house capabilities for laser diode assembly and testing. This offers the benefit of providing a diverse and

Custom Laser Electronics Solutions

We ensure that the products we offer can be effortlessly integrated into your production lines, enhancing productivity and consistency. With customization, we provide custom-built solutions that meet the

Laser Diode Technology

Low-power laser diodes come in a variety of packages. Most have a monitor photodiode integrated with the laser diode. Generally, laser diodes emit light

Laser Diode

A laser diode (LD) is defined as a forward-biased semiconductor diode that emits coherent light when an electrical current stimulates recombination of electrons and holes at the p-n junction. It consists of

Custom Laser Diode Solutions for High-Precision

Moreover, custom laser diode solutions offer flexibility in form factor and integration options. Manufacturers can design diodes with specific package

Laser-written reconfigurable photonic integrated circuit

This work reports on the direct coupling of a PIC, fabricated by femtosecond laser writing (FLW), and a silicon single-photon avalanche diode

Contact Us

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