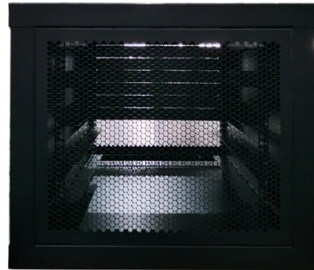


Doe laser diode



AI Overview

A DOE laser diode combines a laser diode with a diffractive optical element to shape, split, or pattern the laser beam for precise applications.

Overview A DOE (Diffractive Optical Element) laser diode integrates a standard laser diode with a microstructured optical element that manipulates the emitted light through diffraction. This allows the laser beam to be transformed from a simple Gaussian profile into custom patterns such as lines, grids, circles, or top-hat intensity distributions, depending on the DOE design ().

Functionality

- Beam Shaping:** Converts a Gaussian laser beam into uniform intensity profiles (Top-Hat) for consistent illumination across a surface, ideal for material processing or medical applications ().
- Beam Splitting:** Divides a single laser beam into multiple beams with controlled spacing and intensity, useful in multi-channel processing or metrology ().
- Pattern Generation:** Produces geometric patterns like cross-hairs, dotted lines, or pseudo-random dot arrays for imaging, measurement, or alignment tasks ().

Technical Specifications DOE laser diodes are available in various wavelengths, powers, and configurations. For example, a typical 635 nm red DOE laser diode may have:

- Optical power: 5 mW
- Laser class: 1, 1M, or 2M depending on configuration
- Beam divergence: ~ 1 mrad
- Lifetime: $> 3,000$ hours
- Operating voltage: 3–5 V DC
- Adjustable or fixed focus options ().

The DOE microstructure is usually fabricated on plastic or glass, and the laser diode can be single-mode or multi-mode depending on the application.

Applications DOE laser diodes are widely used in:

- Medical technology:** Laser treatments, diagnostics, and surgical procedures
- Material processing:** Laser cutting, welding, marking, and annealing
- Imaging and measurement:** Metrology, photography, and alignment systems
- Industrial automation:** Multi-beam processing for high throughput ().

Advantages

- Energy-efficient beam shaping with minimal light loss
- Customizable patterns for specific applications
- Compact integration with standard laser diodes
- Hig...

Article Content

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When it comes to engraving metal, not all laser machines are created equal. While CO₂ and diode lasers can handle some materials well, they do not

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DOE Brochure_website

Renowned laser module manufacturers provide integration of both our standard and customized diffractive optical elements (DOEs) into their products. DOEs utilize a microstructure surface relief

Diffractive Optical Elements (DOE) for Laser Modules

By using a diffractive optical element (DOE) a simple dot laser beam can be transformed into a large variety of patterns and beam shapes. Various pattern are available leading to cross-hair beams,

FLEXPOINT® DOE Series

LASER COMPONENTS offers a wide range of different patterns as crosses, parallel lines, dot lines, dot matrix and many more. The DOEs can be integrated into our standard FLEXPOINT® laser modules.

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405nm Laser Diode Market Report: Trends, Forecast and Competitive Analysis to 2031 - The future of the global 405nm laser diode market looks promising with opportunities in the

Diode Lasers: Definition, How They Work, Types,

Laser diodes are widely used across various industries, including telecommunications, material processing, and medical treatments. This article

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Laser diode

Laser diodes form a subset of the larger classification of semiconductor p – n junction diodes. Forward electrical bias across the laser diode causes the two

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What laser cutter should you buy in 2026? Compare CO2, diode, and fiber lasers by materials, budget, speed, and workspace so you choose the right machine the first time.

How semiconductor laser diodes work

A simple overview of how semiconductor diodes work like a cross between ordinary (gas) lasers and LEDs.

DOE Laser Module Guide: Patterns, Principles

Drive electronics for DOE modules follow standard constant-current laser diode requirements. The DOE element itself is passive — it adds no electrical

DOE Laser Module

The IADIY DOE Laser Module integrates precision optical DOE (Diffractive Optical Element) lenses with high-quality laser diodes, enabling stable and accurate

Diffractive Optical Elements (DOEs) | Jenoptik

Diffractive Optical Elements for High-precision, Energy-efficient Laser Applications
Jenoptik provides you with diffractive optical elements tailored to your specific

What are Laser Diodes? | TechWeb

A laser diode (semiconductor laser) is an electronic component that generates laser light by converting electric current into light using a

DOE_Dot-Matrix (Dot Matrix)

A beam splitter in the context of diffractive optics is a device that utilizes diffractive elements to divide a beam of light into two or more separate

48 Laser Diode Manufacturers in 2026

48 Laser Diode Manufacturers in 2026 This section provides an overview for laser diodes as well as their applications and principles. Also, please take a look at the list of 48 laser diode manufacturers and

Teledyne Qioptiq

Teledyne Qioptiq delivers cutting-edge optic solutions for dismounted soldier systems, avionics, optronic modules, and space applications.

Diode: Definition, Symbol, and Types of Diodes

Key learnings: Diode Definition: A diode is defined as a component that restricts the direction of flow of electric current, mainly allowing current to

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Various reputable laser module makers offer integration of our off-the-shelf DOEs into their products. For requirements beyond the off-the-shelf product range, we offer development of customized DOEs

Diffraction Optic Elements (DOE)

The beam shaping element is a diffractive optical element (DOE) used to transform a near-gaussian incident laser beam into a uniform-intensity spot of either round,

Contact Us

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

Website: <https://araziyahsafety.co.za>

Email: info@araziyahsafety.co.za

Phone: +27 72 418 3692

Address: 123 Rivonia Road, Sandton, Johannesburg, 2196, South Africa

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