What material is the new type of laser diode made of

Overview

Aluminum gallium arsenide (AlGaAs) is the semiconductor material in the laser structure. A laser diode (LD, also injection laser diode or ILD or semiconductor laser or diode laser) is a semiconductor device similar to a light-emitting diode in which a diode pumped directly with electrical current can create lasing conditions at the diode's junction. : 3 Driven by voltage, the doped. In this article, the development of mid-UV laser diodes based on the AlGaN materials system is reviewed. The targeted wavelength for these lasers covers the range from 200 to 350 nm. In such a heterostructure of a bipolar interband laser, electrons and holes can recombine, releasing the energy. Laser diodes are a diverse family of electrically pumped semiconductor lasers. All lasers have key characteristics in common though: A gain mechanism and a resonating cavity.

Article Content

Jan 08, 2026

Laser Diodes – semiconductor, gain, index guiding, high power

In particular, there are quantum cascade lasers and optically pumped semiconductor lasers. The latter can be made of undoped semiconductor materials which cannot conduct significant electric currents. …

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Here we report the electrically driven gallium arsenide (GaAs)-based laser diodes fully fabricated on 300-mm Si wafers in a CMOS pilot manufacturing line based on a new integration …

Mar 28, 2026

Laser diode

OverviewTheoryHistoryTypesReliabilityApplicationsCommon wavelengthsFurther reading

A laser diode is electrically a PIN diode. The active region of the laser diode is in the intrinsic (I) region, and the carriers (electrons and holes) are pumped into that region from the N and P regions respectively. While initial diode laser research was conducted on simple P–N diodes, all modern lasers use the double-hetero-structure implementation, where the carriers and the photons are confined in order to maximiz…

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As high-powered laser diode technology enters its next phase of growth, the drivers shaping the technology''s success are opening opportunities for device designers to innovate. By Mark Crowley …

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Laser Diode

The rapid development of laser diodes with new and improved specifications will continuously open further application fields as, for example, compact laser displays with high brilliance making use of …

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Laser diode

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15 Different Types of Diode Lasers

Edge-emitting diode lasers are formed from a chip made of gallium arsenide (GaAs), indium phosphide (InP), or gallium nitride (GaN). The chip is composed of two (or more) layers, including the …

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In this article, the development of mid-UV laser diodes based on the AlGaN materials system is reviewed. The targeted wavelength for these lasers covers the range from 200 to 350 nm.

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The Role of Laser Diodes in Innovation

Materials like germanium (Ge), palladium (Pd), titanium (Ti), gold (Au), and platinum (Pt) are essential to both the structure and functionality of laser diodes.

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The extension into the visible wavelength range using arsenides is not possible due to the narrow bandgap of the material. Based on their stability, InGaN-based laser diodes emerged as the …

Apr 26, 2026

Laser Diode 101

The semiconductor materials used for laser diodes depend on the desired laser emission wavelength. The gain region is then created using different semiconductors and their common dopants.

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