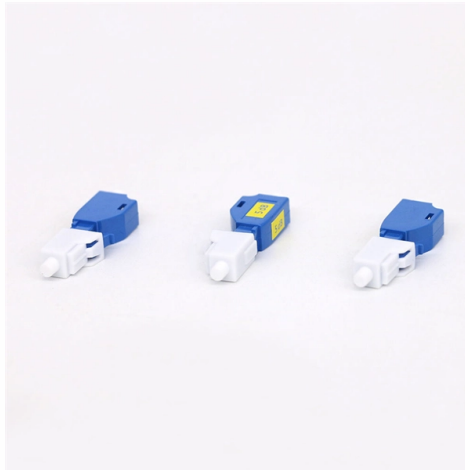


Wireless Laser Lens with Diode



AI Overview

A wireless laser lens with diode is a compact system that combines a laser diode with precision optics to produce a focused or collimated beam, often used in medical, industrial, and optical applications.

Overview A wireless laser diode system integrates a laser diode with a lens assembly and a battery-powered control unit, allowing portable operation without direct power cables. These systems are commonly used in medical procedures such as soft tissue surgery, hemostasis, and periodontal treatments, as exemplified by the DentaLaze® wireless diode laser, which features ergonomic design and fiber optic tips for precise delivery of laser energy (Shofu USA).

Function of the Lens The lens in a laser diode system serves to shape, focus, or collimate the naturally divergent light emitted by the diode. Laser diodes emit light in an elliptical, highly divergent pattern, which can be corrected using:

- Aspheric lenses:** Minimize spherical aberration and improve focus quality for highly divergent beams.
- Cylindrical lenses:** Correct elliptical beams to produce a circular beam for precision applications.
- Achromatic lenses:** Focus multiple wavelengths to the same point, useful in multi-wavelength systems.
- Ball lenses:** Commonly used for fiber coupling to maximize light transmission into optical fibers (MOK Optics).

The collimation process involves adjusting the distance between the diode and the lens to produce a parallel beam, which is critical for applications requiring precise targeting or long-distance propagation (Universe Optics).

Key Technical Considerations

- Focal length:** Determines how tightly the beam is focused; shorter focal lengths produce smaller, high-precision spots.
- Numerical aperture (NA):** Higher NA allows tighter focusing but increases sensitivity to alignment errors.
- Anti-reflection coatings:** Reduce reflection losses and improve transmission efficiency.
- Material selection:** Fused silica for UV lasers, optical glass for visible and IR lasers, chosen to match the diode wavelength.

Applications Wireless laser diode systems with precision lenses are use...

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1pcs DC12V Aluminum 532nm 50mW Green Laser Diode Module. Output power: 50mW. Structural Features: Laser Diode Lens Heat Sink Case. 1pc 12V Adapter. Reverse polarity protection:

DentaLaze® - Shofu USA

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Herein, we report wireless, wearable phototherapeutic devices with red light-emitting diodes for continuous treatments. Red light-emitting diodes were formed to be conformal to three-dimensional

Diode Laser Lens Assemblies

Diode Laser Lenses for collimators, CD & DVD players, laser pointers, laser levels, laser surface inspection systems and positioning & measuring equipment.

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This study proposes a compact optical transceiver that integrates both transmission and reception functionalities into a single module, utilizing a wavelength-shifting fiber (WSF) and a blue

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Wavelength-shifting fiber-based optical detectors offer a promising solution to enhance transmission performance in optical wireless communication (OWC) systems. This study proposes a

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