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Low-power red light from laser diodes



Overview

Our selection of Low-Powered Visible Diode Lasers offers a few key features including: High efficiency and long lifetime.

Key Takeaways

Low-power red laser diodes typically emit light in the 635–670 nm range with output powers from a few milliwatts up to several hundred milliwatts, suitable for compact optical systems, sensors, and laser pointers.Characteristics of Low-Power Red Laser Diodes

Low-power red laser diodes are semiconductor devices that generate coherent red light when electrically pumped. They are based on materials such as GaInP or AlGaInP quantum wells, which determine the emission wavelength and efficiency . Typical wavelengths for these diodes are 635 nm, 650 nm, and 660–670 nm, with shorter wavelengths offering better visibility to the human eye but slightly lower efficiency . Output powers for low-power diodes generally range from a few milliwatts to several hundred milliwatts, making them ideal for applications that do not require high-intensity beams .

Advantages and Features
• High efficiency and long lifetime: Modern low-power red diodes are designed for energy-efficient operation and extended service life .

• Compact packaging: Small form factors allow integration into highly compact systems, such as handheld devices or portable sensors .

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• Temperature tolerance: Many diodes operate reliably over a wide temperature range, which is important for industrial and outdoor applications .

• Beam quality: Single-mode diodes provide a narrow, well-collimated beam, while multi-mode diodes offer higher output power with slightly lower beam quality .
Applications

Low-power red laser diodes are widely used in:

• Laser pointers and presentation tools .

• Barcode scanners and optical sensors for industrial automation and logistics .

• Distance measurement and TOF (Time-of-Flight) sensors, where short-pulse high-power diodes improve accuracy .

• Compact optical systems in research or consumer electronics, including DVD players and small-scale alignment tools .
Technical Considerations
• Electrical driving: Laser diodes are typically driven by a constant current source to maintain stable output and prevent damage .

• Wavelength selection: The choice of diode wavelength depends on visibility requirements, detector sensitivity, and application-specific needs .

• Safety: Even low-power red diodes can be hazardous to the eyes if viewed directly; proper safety precautions are recommended. In summary, low-power red laser diodes provide a versatile, efficient, and compact source of coherent red light, with applications ranging from consumer electronics to industrial sensing, all while offering high reliability and long operational life .

Article Content

Low Power Visible Laser Diodes – Red

Our selection of Low-Powered Visible Diode Lasers offers a few key features including: High efficiency and long lifetime. Wide

Low Power Visible Laser Diodes

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