Diode Lasers and Their Applications

Module 2-6

of

Course 2, *Laser Systems and Applications*

2nd Edition

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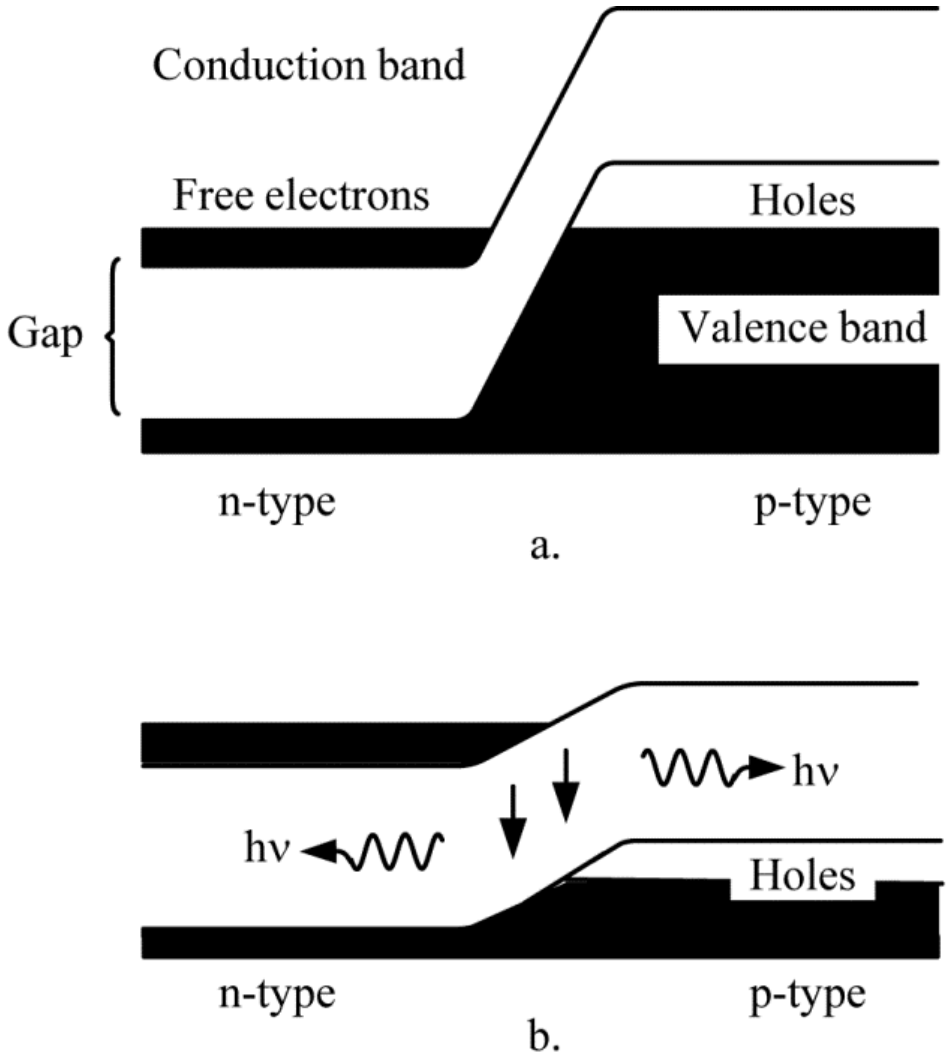

Figure 6-1 *Energy-level diagram of a semiconductor diode*
a) No voltage; b) forward applied voltage

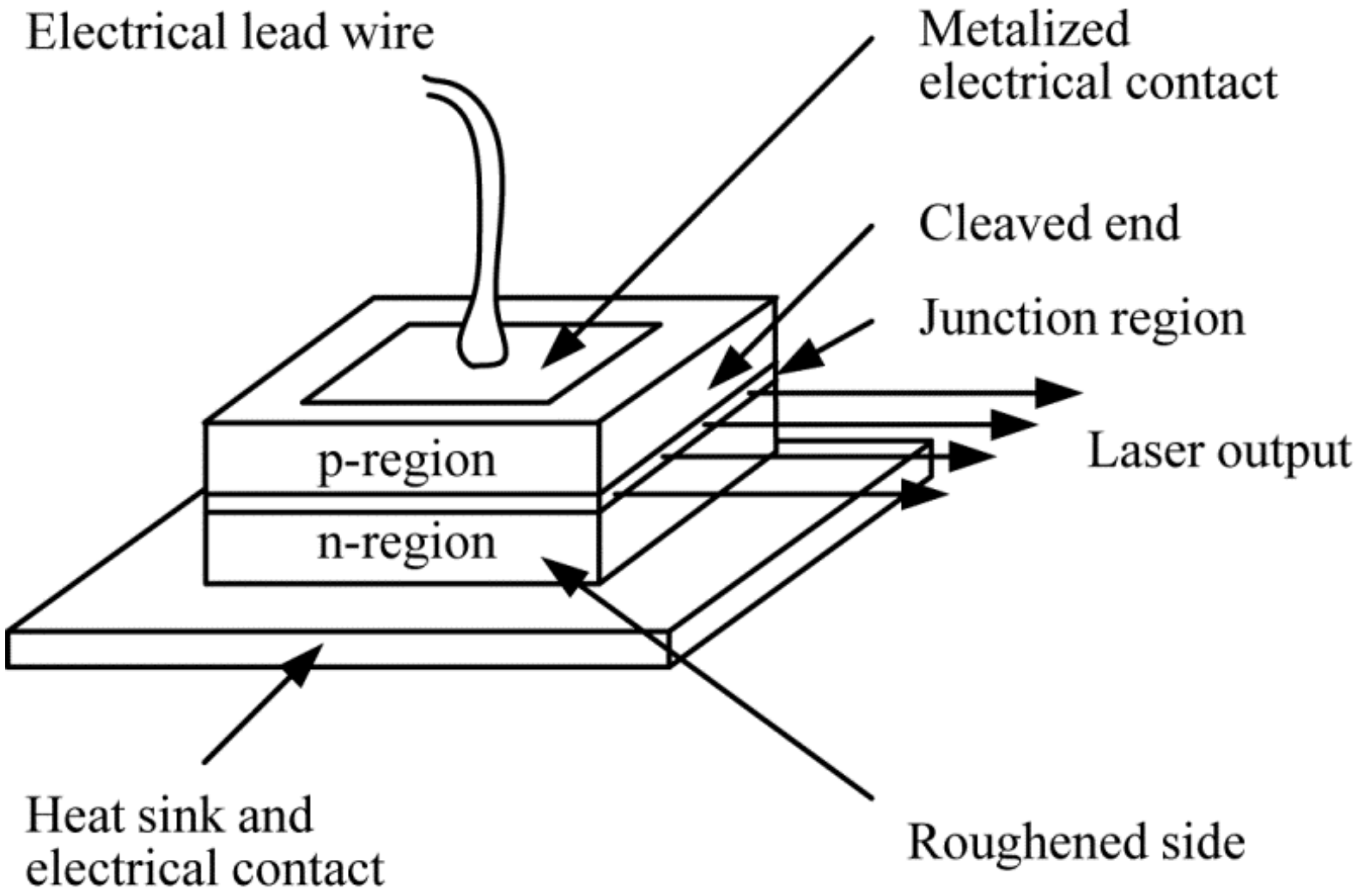

Figure 6-2 *Gallium arsenide laser diode*

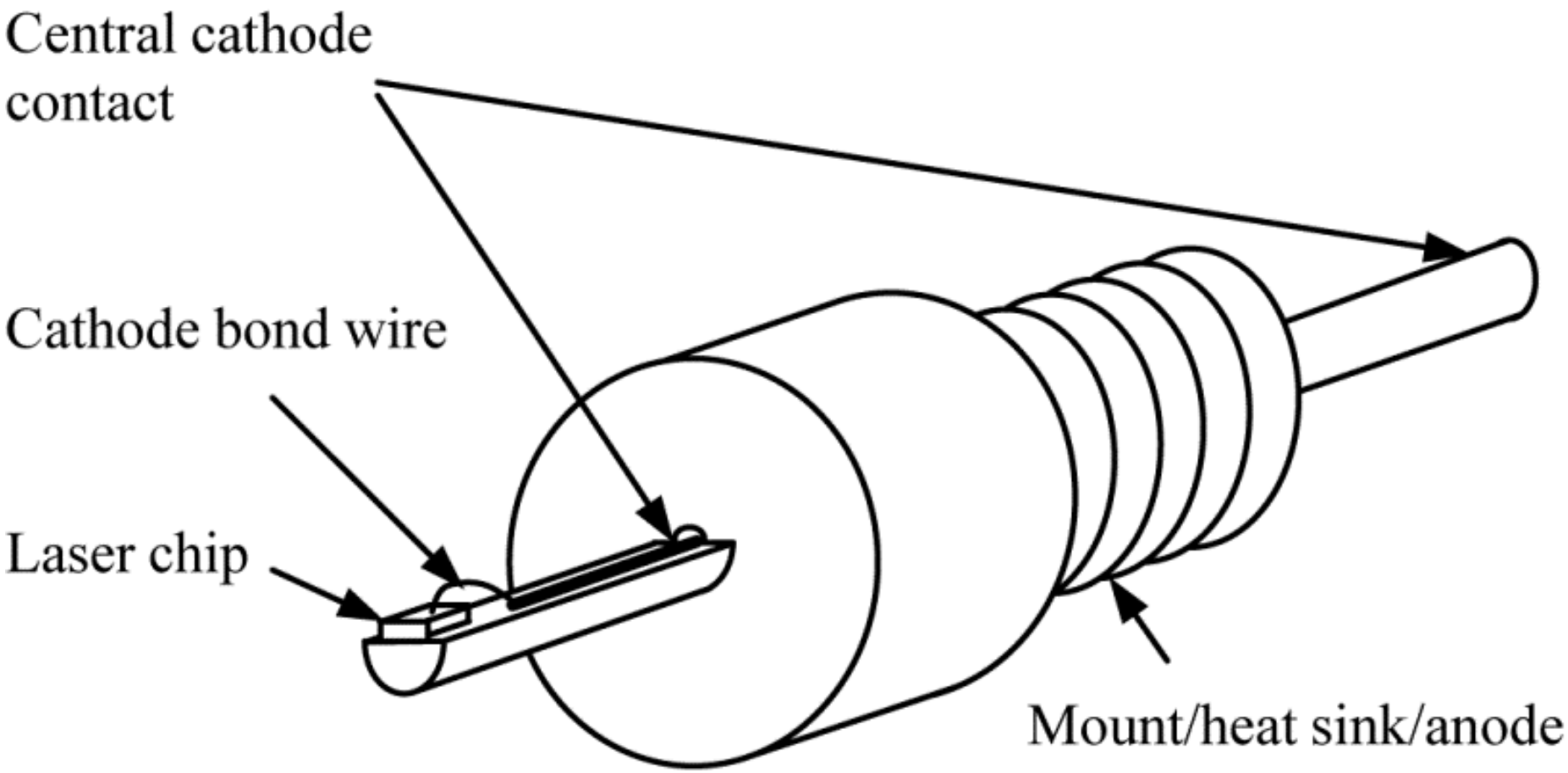

Figure 6-3 *Example of a mounting for a semiconductor laser*

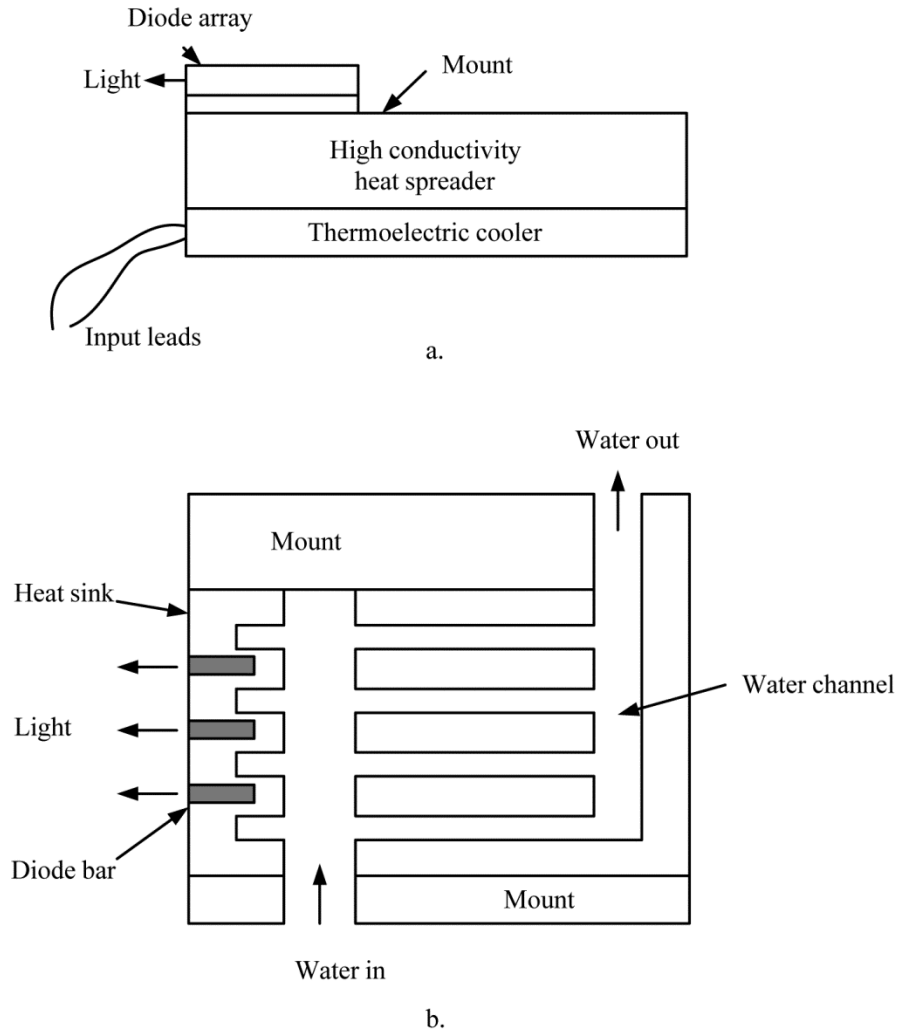

Figure 6-4 *Methods for active cooling of semiconductor lasers. a) Side view of a thermoelectric cooler; b) Top view for cooling a diode laser bar.*

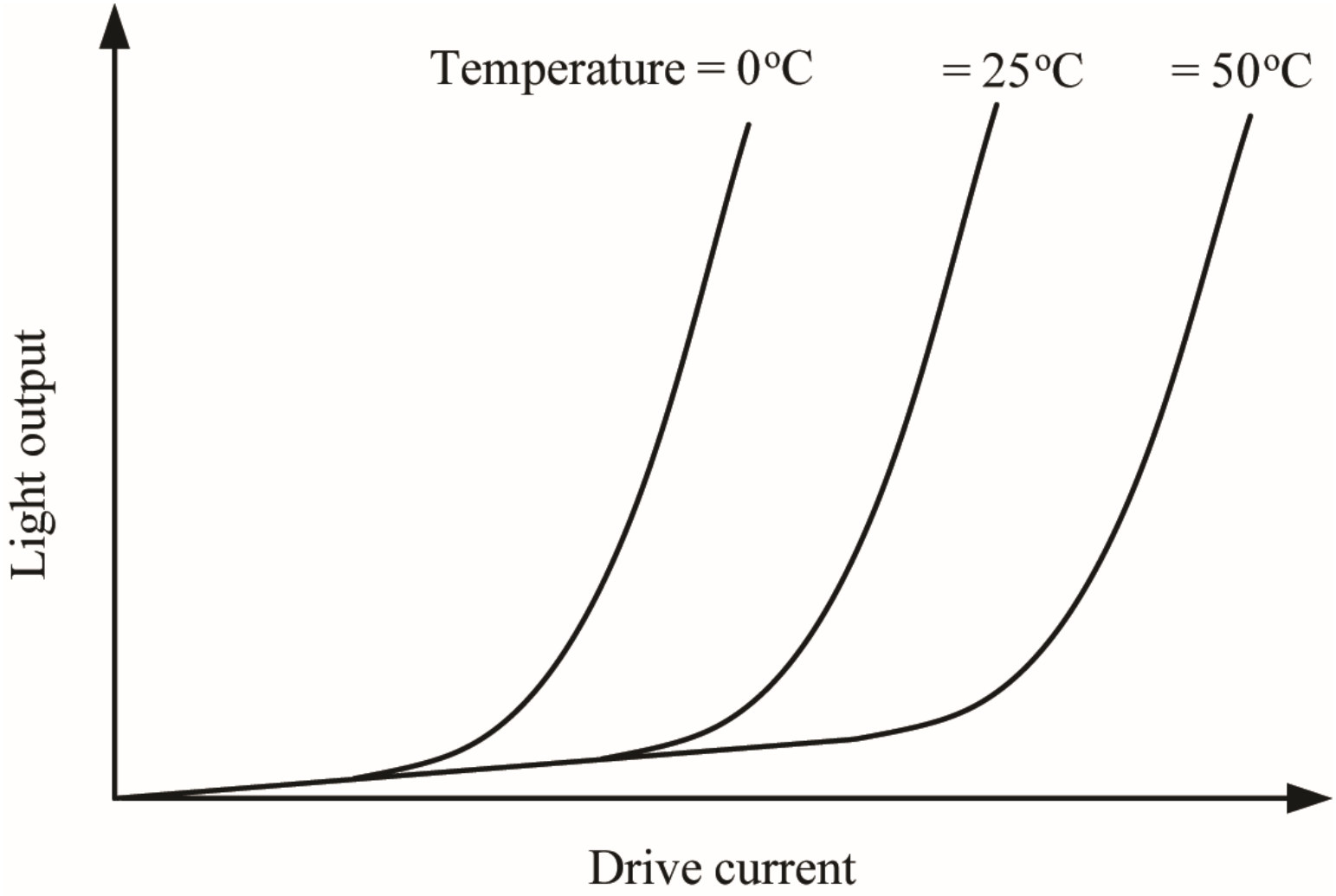

Figure 6-5 *Output of a semiconductor laser as a function of drive current for different operating temperatures*

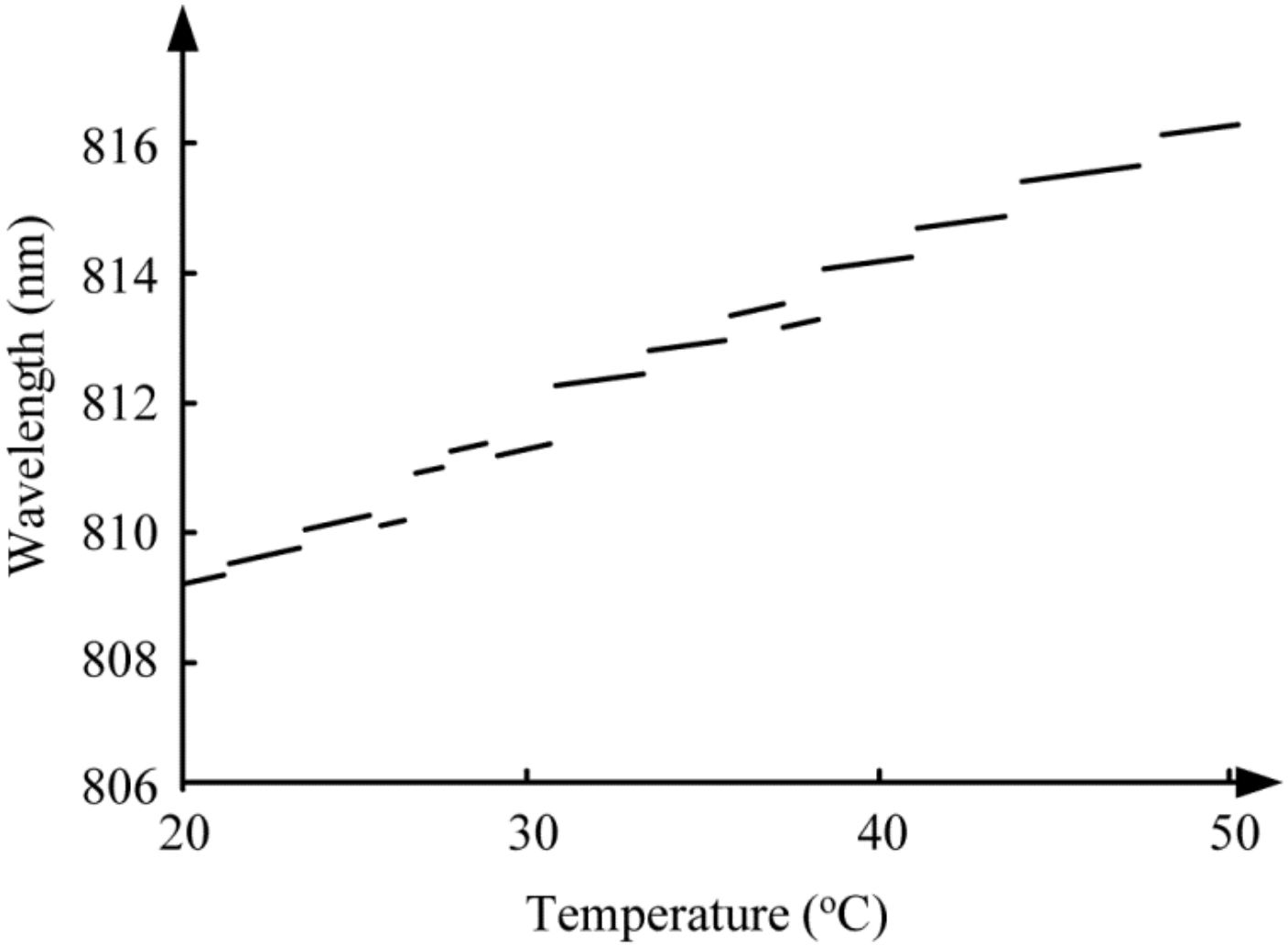

Figure 6-6 *Variation of the wavelength of a commercial semiconductor laser with temperature*

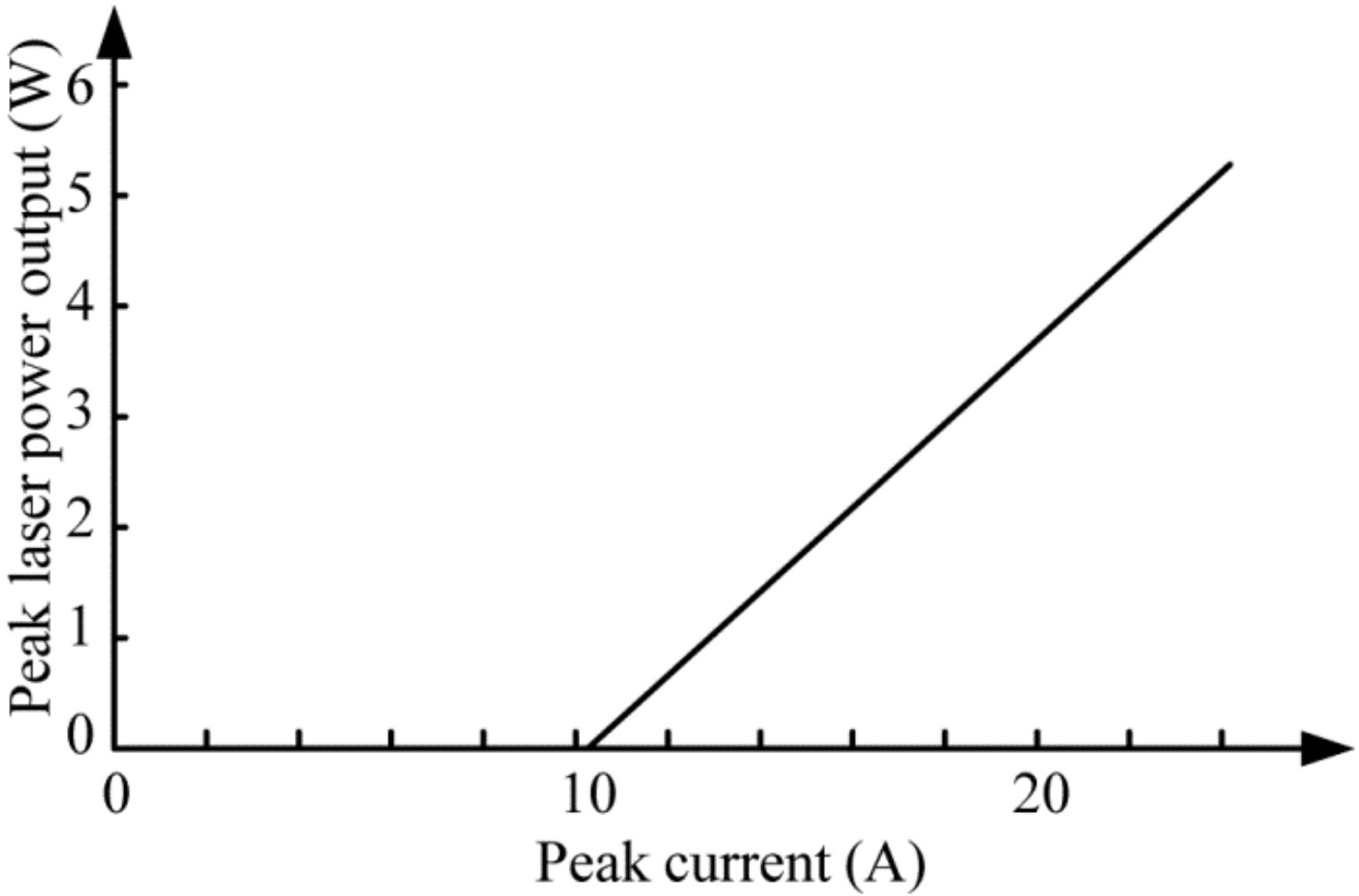

Figure 6-7 *Peak power output of laser diode as a function of peak input current*

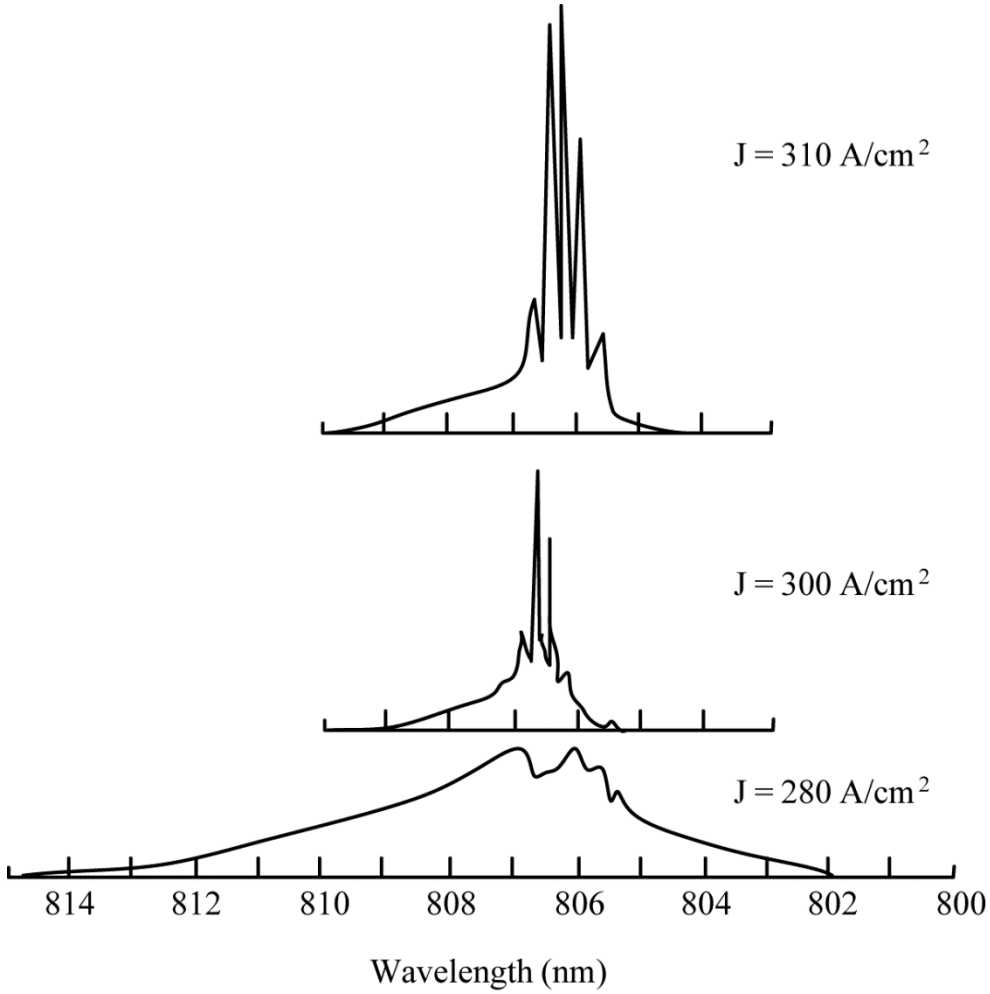

Figure 6-8 *Output spectrum of a gallium arsenide laser at various input current densities for continuous operation of a double heterojunction device at cryogenic temperatures*

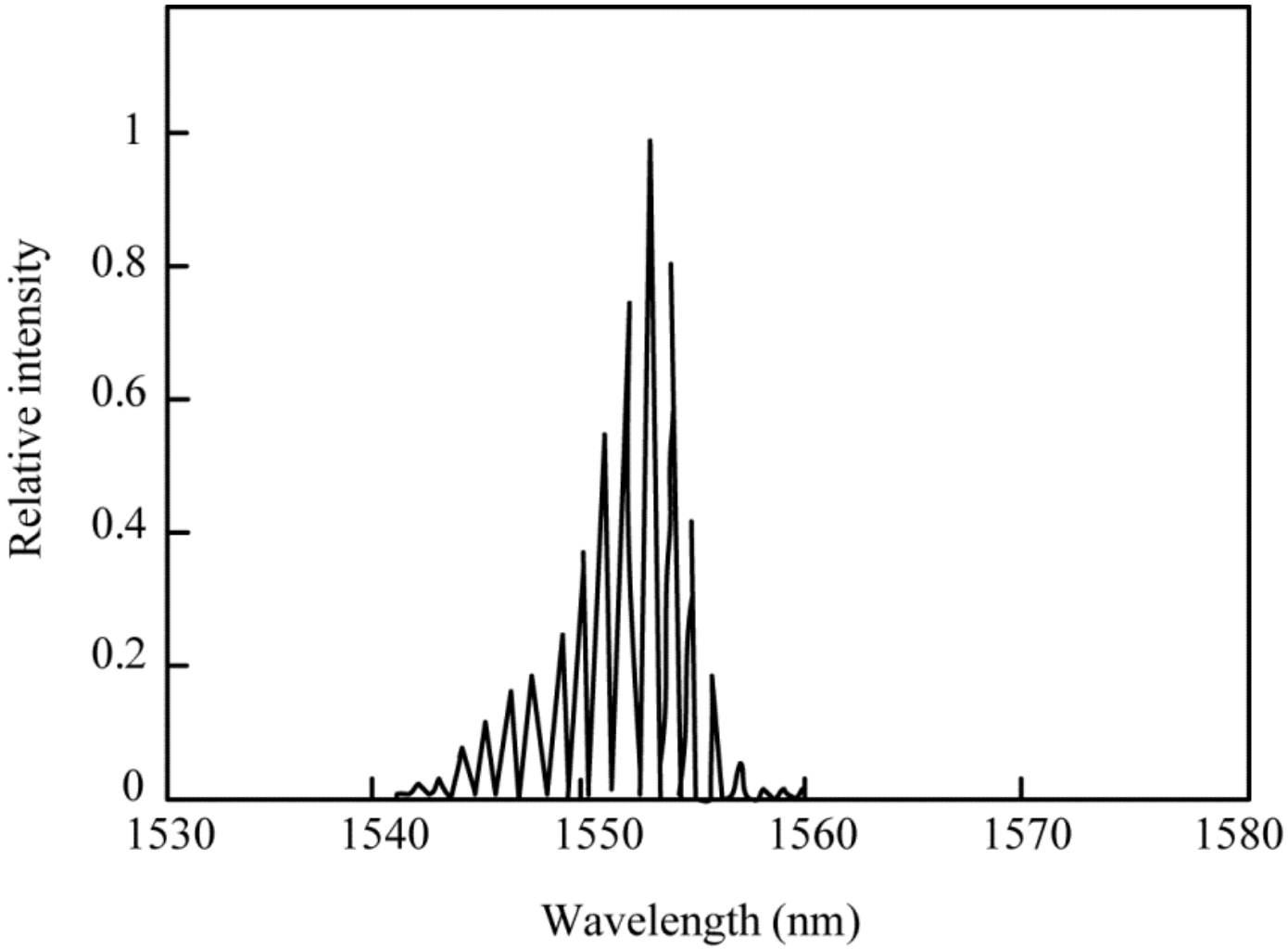

Figure 6-9 *Spectral emission of a commercial semiconductor laser operating at a wavelength near 1550 nm*

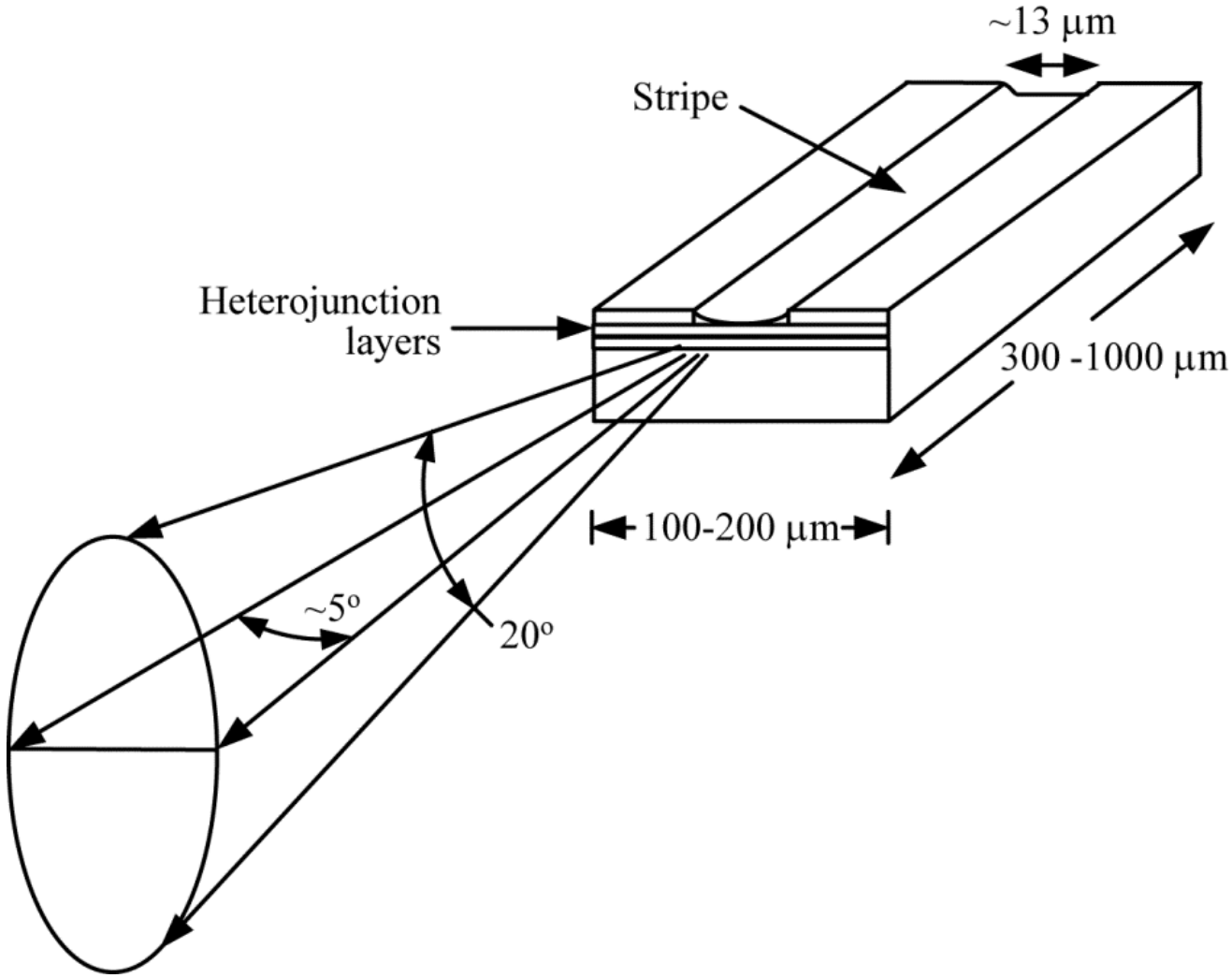

Figure 6-10 *Beam profile from a stripe geometry heterojunction semiconductor laser*

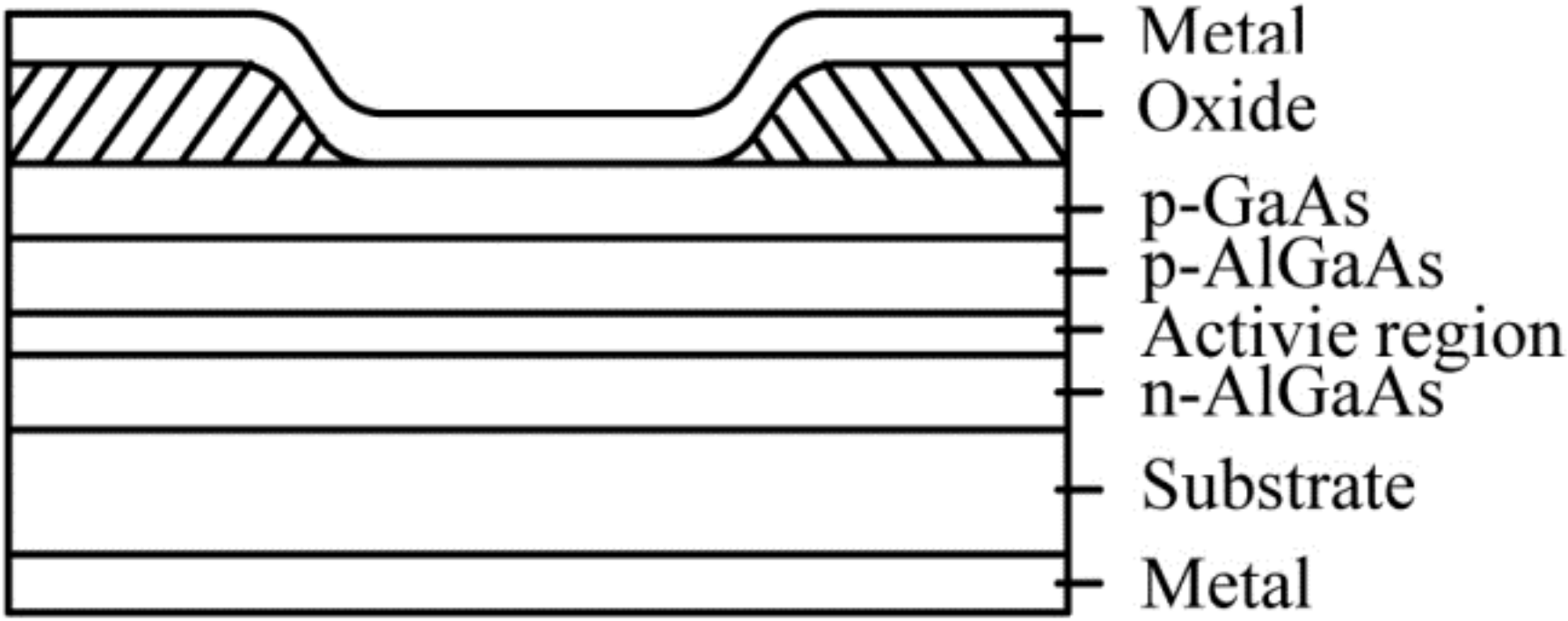

Figure 6-11 *Diagram of GaAs/AlGaAs laser with oxide stripe geometry*

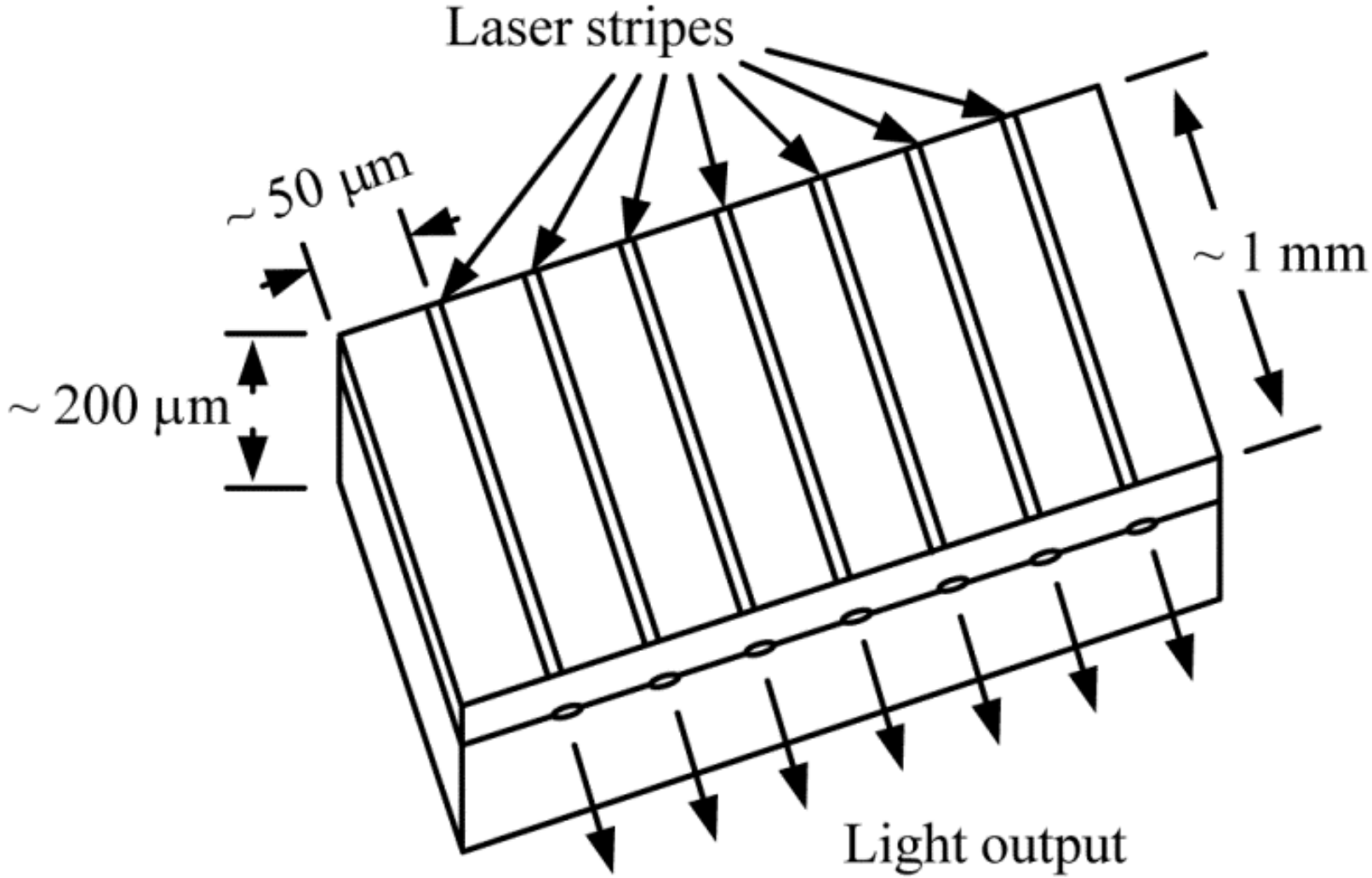

Figure 6-12 *Diagram of a semiconductor laser bar*

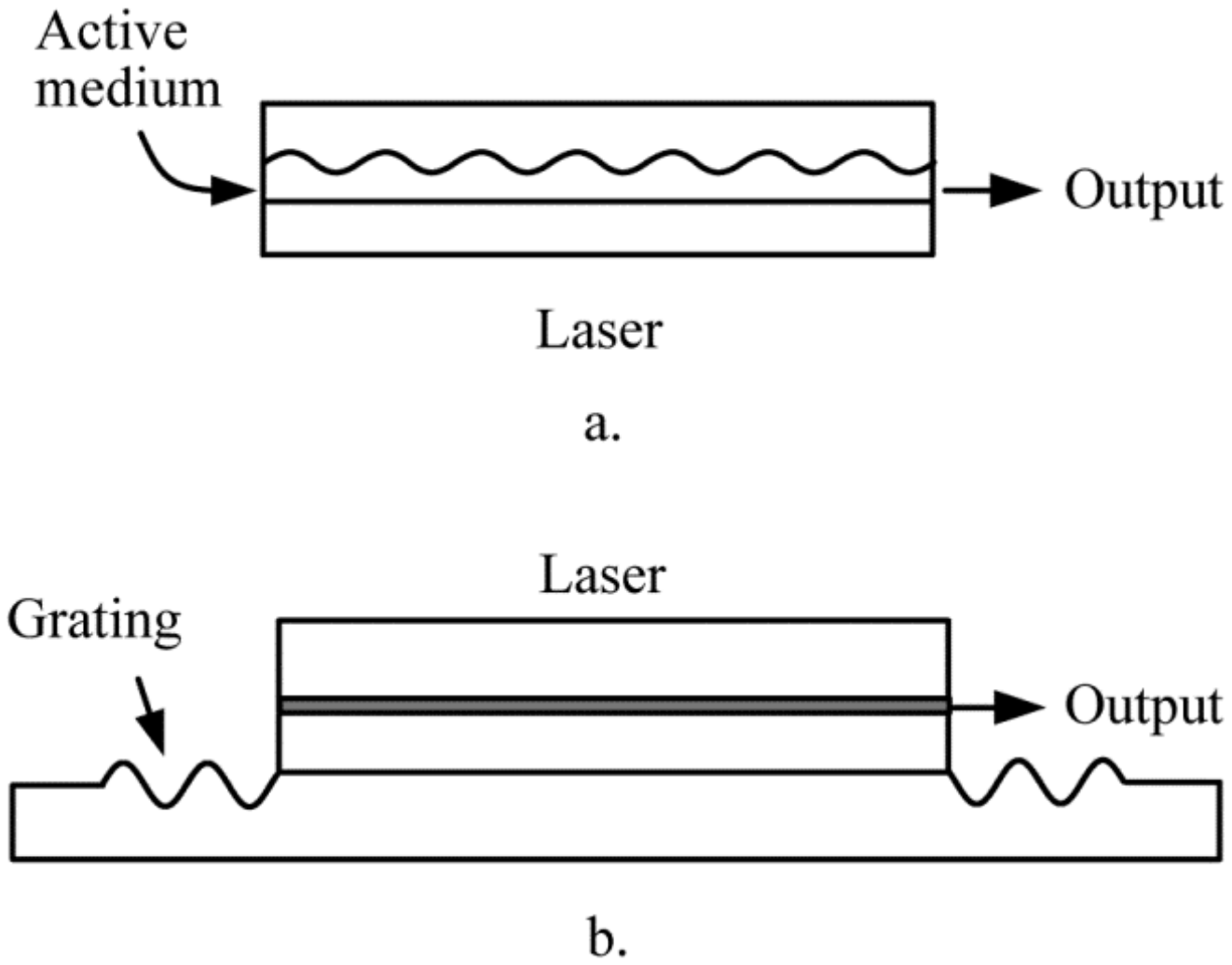

Figure 6-13 *Diagram of the side view of: (a) a distributed-feedback semiconductor laser and (b) a distributed Bragg reflector*

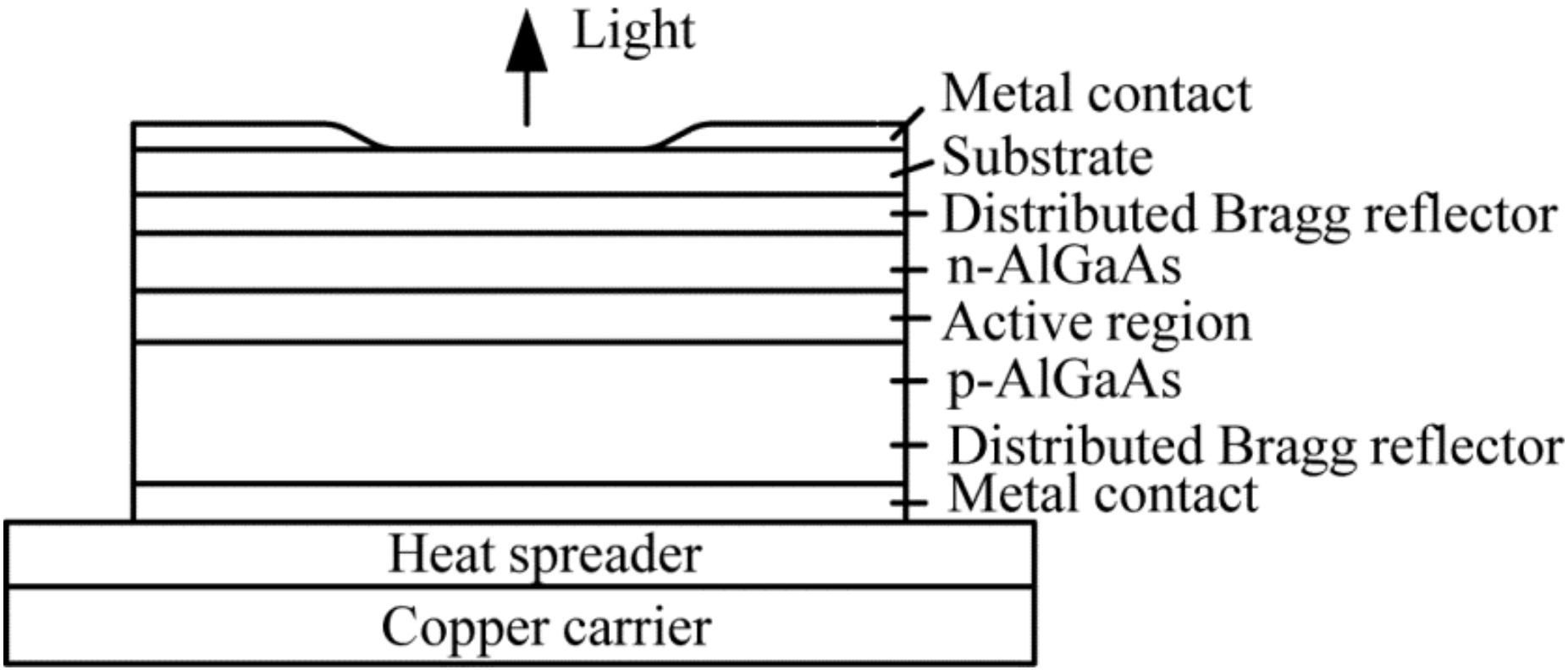

Figure 6-14 *Diagram of one possible configuration of a VCSEL*

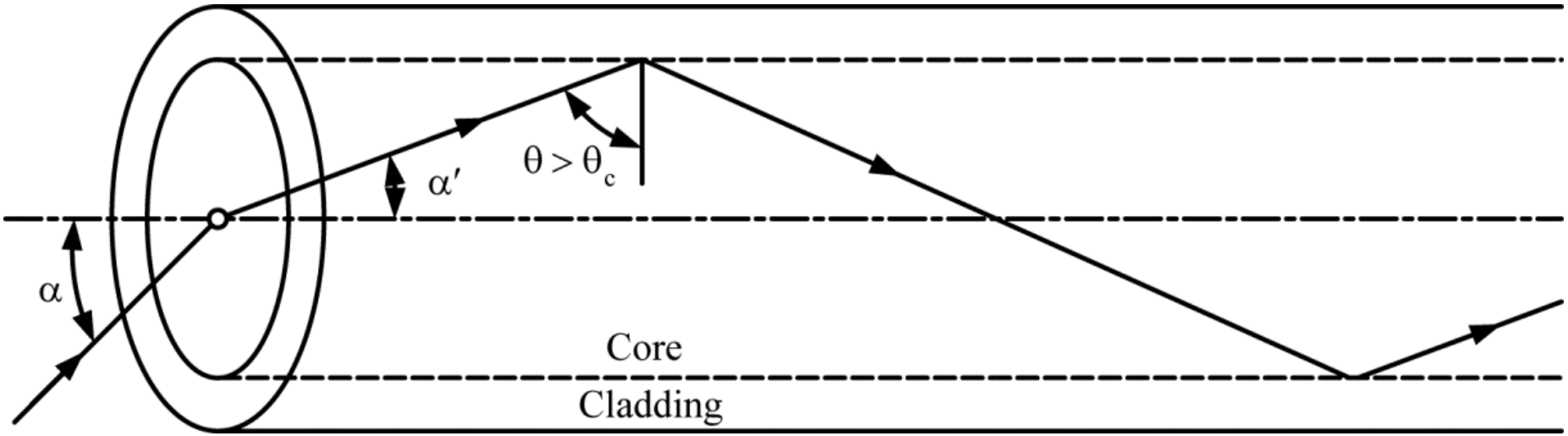

Figure 6-15 *Injection of light into the core of an optical fiber*

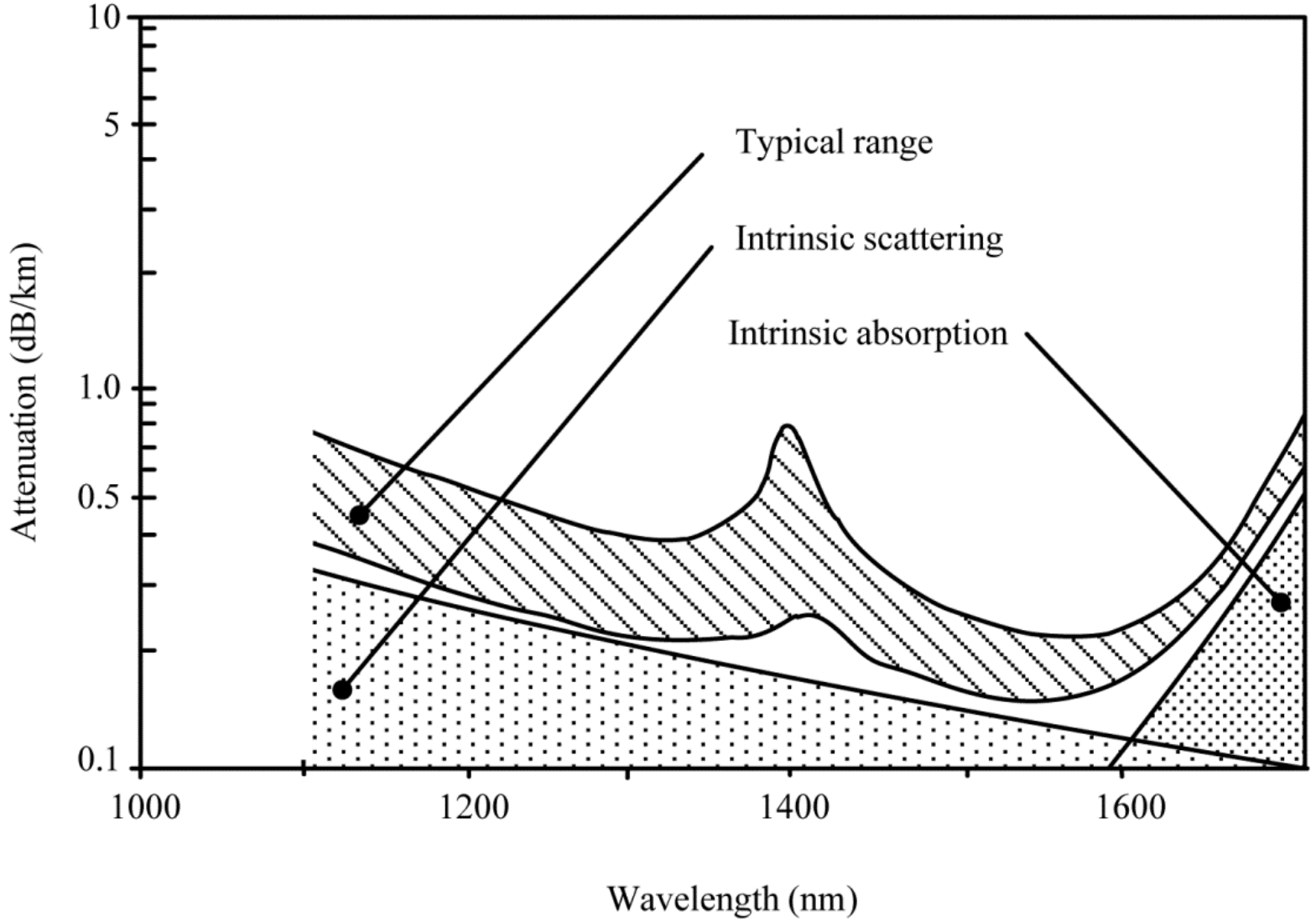

Figure 6-16 *Loss as a function of wavelength for optical fibers*

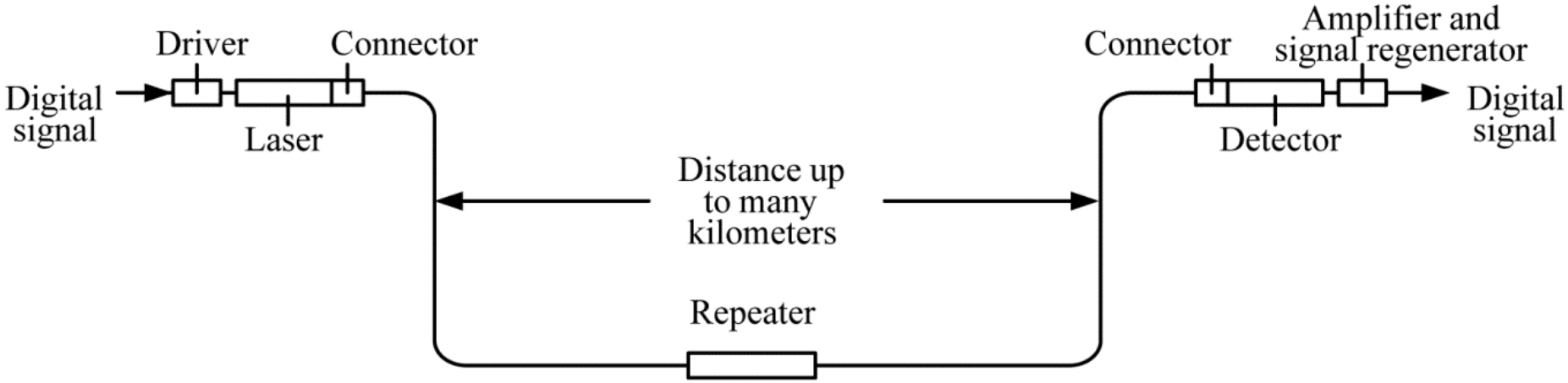

Figure 6-17 *Example of a laser-based optical fiber telecommunications system*

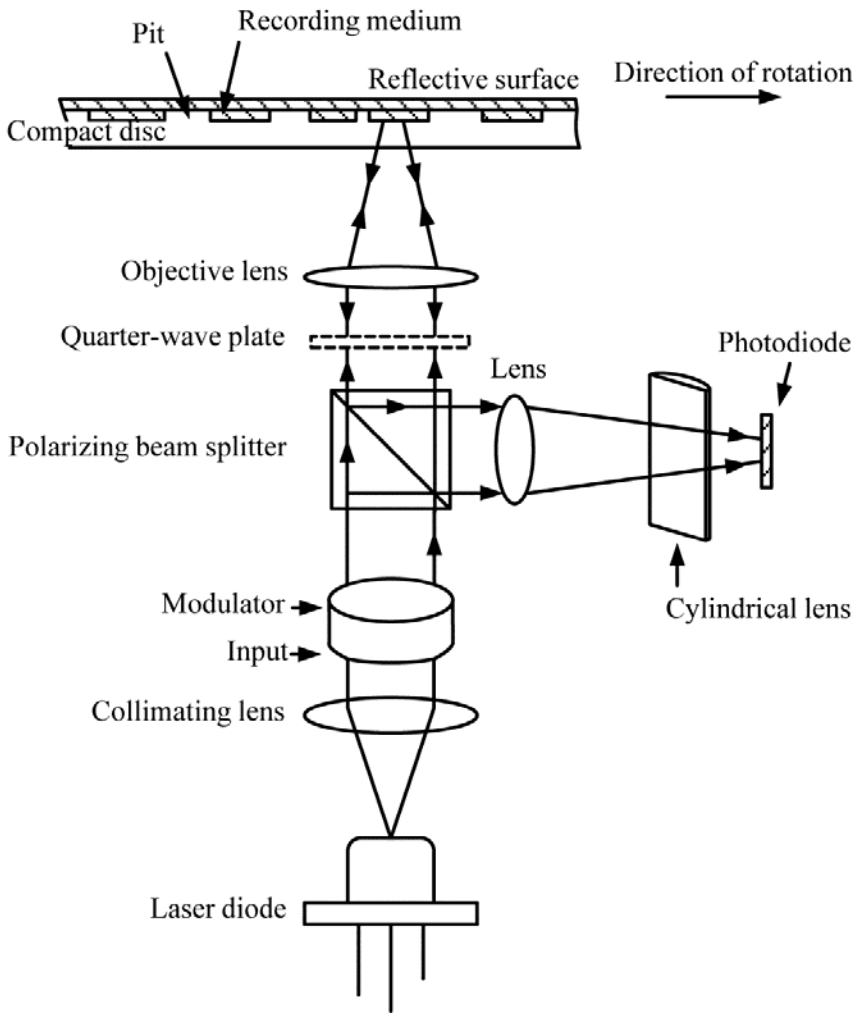

Figure 6-18 *Example configuration for a write-once, read-mostly optical memory*

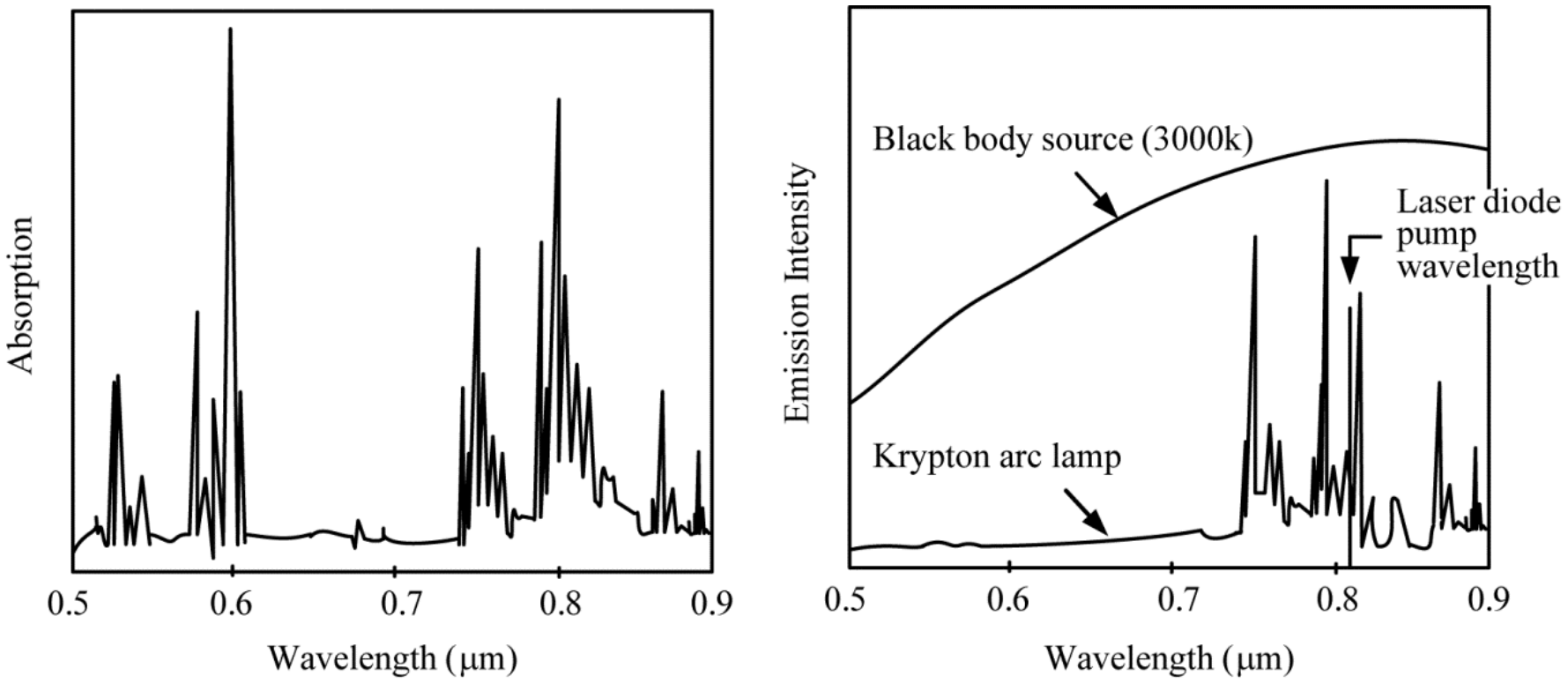

Figure 6-19 *Left: Absorption spectrum of Nd:YAG. Right: Emission spectra of pump sources compared with the Nd:YAG absorption spectrum.*

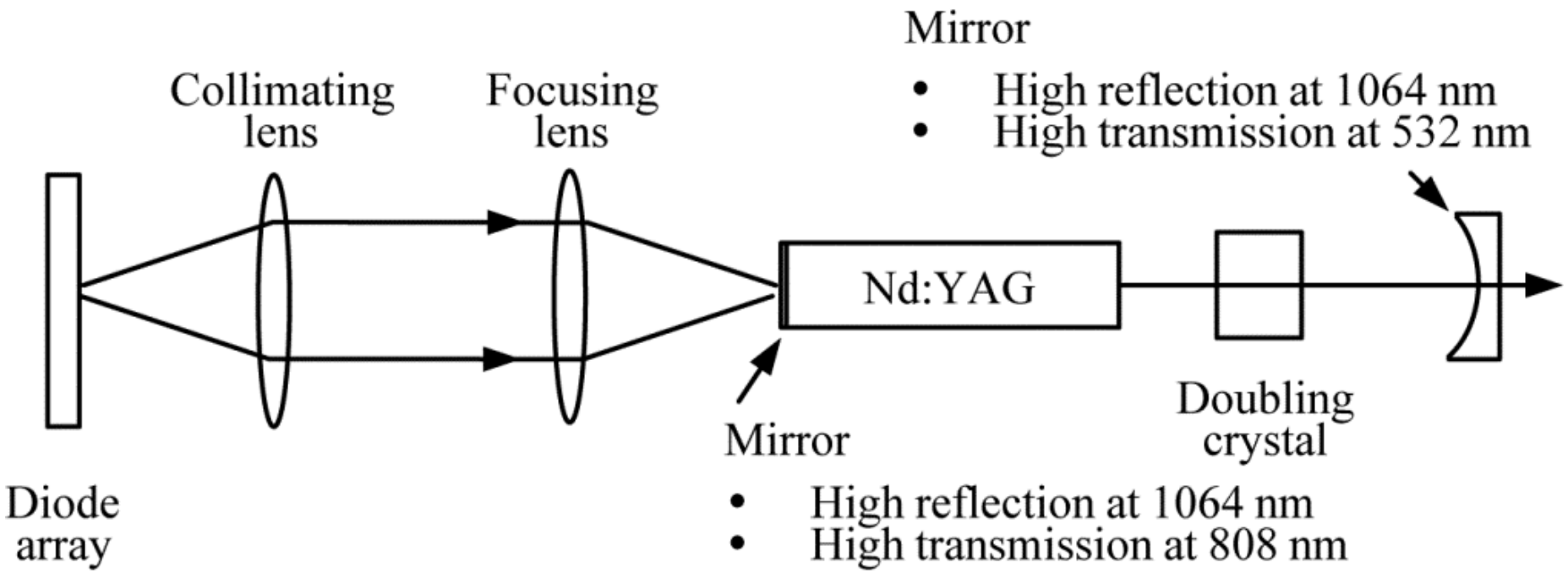

Figure 6-20 *Configuration for an end-pumped, diode pumped intracavity-doubled Nd:YAG laser*

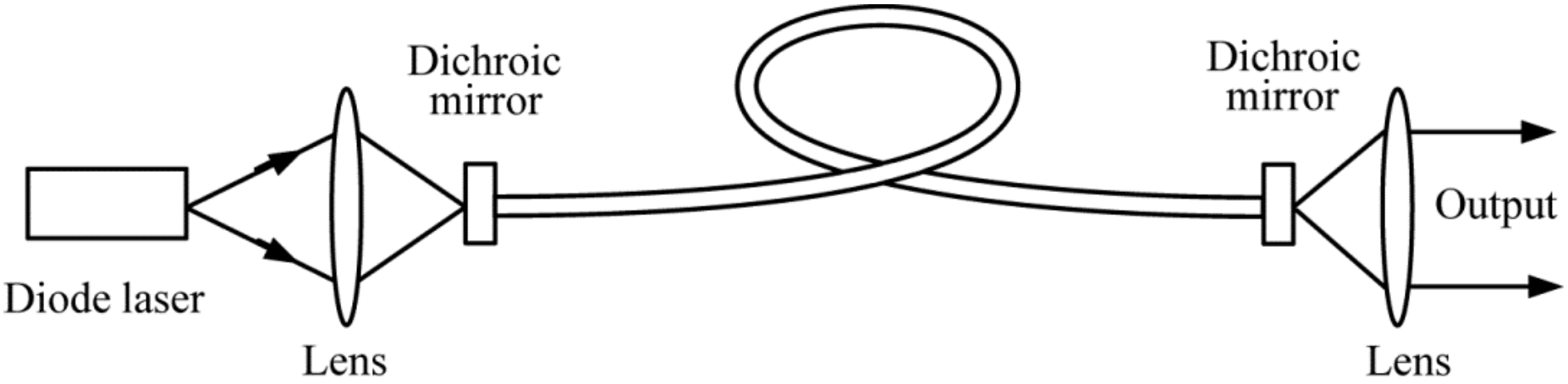

Figure 6-21 *Simple diagram of a fiber laser*