SEMICONDUCTOR LASER HAVING CO-DOPED DISTRIBUTED BRAGG REFLECTORS

Abstract of the Disclosure

This invention provides a semiconductor laser device, such as a Vertical Cavity Surface-Emitting Laser (VCSEL) device which includes a Distributed Bragg Reflector (DBR) (27, 29) made up of layers (33, 35) which are co-doped with different dopants. For instance, a p-type DBR (27) produced by organometallic vapor-phase epitaxy (OMPVE) includes layers having, respectively, a low refractive index (33) and a high refractive index (35), the layers being made, respectively, of high-Al AlGaAs and low-Al AlGaAs. According to the invention, C, by itself or in addition to Mg, is used as the dopant in the high-Al AlGaAs layers, and Mg is used in the low-Al AlGaAs layers. Because of this co-doping, the semiconductor laser device achieves low series resistance and operating voltage, with good manufacturability.

Figure 2