Method of Fabricating an Optical Device Using Multiple Sacrificial Spacer Layers

Features

- Uses a simple wet chemical etch to remove the S2L
- Allows for increased or decreased reflectance at PIC interfaces

Description

The primary aim of this technology is integration of semiconductor lasers to planar optical components, such as waveguides, semiconductor optical amplifiers (SOAs) and detectors for photonic integrated circuit (PIC) applications. Lasers such as semiconductor ridge lasers are useful as elements of PICs because these lasers emit light horizontally, where light can be processed by another element that is formed on the horizontal plane of the substrate of the PIC. When working with these types of PICs it is essential to control reflections from the interfaces between the lasers and the integrated photonic components.

This application is for a method of fabricating multiple, integrated, buried-gap structures using standard microelectronics process tools. A key developed process was the use of sacrificial spacer layers (S2L) to create the buried gaps. This is a method that is compatible with the fabrication of photonic integrated circuits. These buried gap structures are currently used as high reflectance mirrors for integrated, laser-based, photonic logic devices. The higher reflectance available from gap structures allows us to manufacture laser structures that were not previously practical to fabricate. The same process can be used for creation of low reflectance interfaces if required.

Remarks

- US Patent No. 7,678,593
- Available: Demonstration
- NSA Reference Number 1489

Potential Applications

- Manufacturing of integrated semiconductor lasers
- Telecommunications Industry

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