CLAIMS

1. A method for reducing thickness variations of a useful layer in a semiconductor structure, comprising:

providing a semiconductor structure including, from its rear side to its front side, a carrier substrate, an insulating layer, and a useful layer, the useful layer having a free surface;

placing the semiconductor structure in an atmosphere containing chemical species in a gaseous form, the chemical species being chemically reactive with the useful layer, kinetics of the chemical reaction being strictly increasing with the temperature of the useful layer; and

at least partially sweeping the free surface of the useful layer with a pulsed laser beam to heat the free surface, a wavelength of the laser beam being different by less than 15 nm, from a central wavelength, for which the sensitivity of the estimated reflectivity of the structure relative to the insulating layer is zero, such that a heating profile of the free surface of the useful layer depends on variations in a thickness of the useful layer, and the heating results in a reduction of the variations in the thickness of the useful layer.

2. The method of claim 1, wherein a duration of pulses of the laser beam is less than l^2/D, wherein D is the coefficient of thermal diffusion in the useful layer, and l is a treatment threshold wavelength.

3. The method of claim 1, wherein the pulsed laser beam has a pulse duration of less than 100 ns.

4. The method of claim 1, wherein the useful layer is a layer of a semiconductor material comprising at least one of silicon, germanium, or silicon germanium alloy.

5. The method of claim 1, wherein the chemical species comprises an etchant for etching the useful layer, and the wavelength of the pulsed laser beam is selected so as to correspond to a negative value of the sensitivity of the estimated reflectivity of the structure relative to the useful layer.

6. The method of claim 5, wherein the chemical species comprises HCl.

7. The method of claim 1, wherein the chemical species are selected to thicken the useful layer by epitaxy, and the wavelength of the pulsed laser beam is selected so as to correspond to a positive value of the sensitivity of the estimated reflectivity of the structure relative to the useful layer.

8. The method of claim 7, wherein the chemical species comprises at least one of silane, disilane, trisilane, monochlorosilane, dichlorosilane, trichlorosilane, tetrachlorosilane germane, monochlorogermane, dichlorogermane, trichlorogermane, or tetrachlorogermane.

9. The method of claim 1, wherein the insulating layer comprises silicon dioxide.

10. The method of claim 1, wherein the insulating layer has a thickness of less than 150 nm.

11. The method of claim 1, wherein the useful layer has a thickness of less than 50 nm.

12. The method of claim 1, wherein an impact point of the laser beam on the free surface of the useful layer has an area greater than 0.1 mm^2.

13. The method of claim 1, wherein the pulsed laser beam has a pulse energy in a range extending from 100 to 1,500 mJ/cm^2.

14. The method of claim 1, wherein the pulsed laser beam has a pulse repetition frequency in a range extending from 1 Hz to 10 kHz.

15. The method of claim 1, wherein the useful layer has a variation in thickness of less than 3 nm.

16. The method of claim 1, wherein the wavelength of the beam is different by less than 7 nm from the central wavelength.

17. The method of claim 10, wherein the insulating layer has a thickness of less than 50 nm.

18. The method of claim 11, wherein the useful layer has a thickness of less than 25 nm.

19. The method of claim 12, wherein an impact point of the laser beam on the free surface of the useful layer has an area greater than 10 mm^2.

20. The method of claim 15, wherein the useful layer has a variation in thickness of less than 2 nm.