Claims

1. A method for transferring a layer from a heterostructure to a receiver substrate, comprising the following steps in succession:
   - providing a donor substrate of a first material and a carrier substrate of a second material,
   - bonding the donor substrate to the carrier substrate,
   - thinning the donor substrate, so as to form said heterostructure comprising the thinned donor substrate on the carrier substrate,
   the formation of the heterostructure further comprising a step of removing a peripheral portion from the donor substrate,
   - forming a weakened region in the thinned donor substrate so as to delimit a layer of the first material to be transferred,
   - bonding said heterostructure to a receiver substrate, the layer of the first material to be transferred being located at the bonding interface,
   - detaching the donor substrate along the weakened region so as to transfer the layer of the first material to the receiver substrate.

2. The method according to Claim 1, wherein the step of removing the peripheral portion from the donor substrate is carried out before the bonding of the donor substrate to the carrier substrate.

3. The method according to Claim 1, wherein the step of removing the peripheral portion from the donor substrate is carried out after the bonding of the donor substrate to the carrier substrate.

4. The method according to Claim 3, wherein the removal of the peripheral portion from the donor substrate further comprises removing a peripheral portion from the carrier substrate facing said donor substrate.

5. The method according to one of Claims 3 and 4, wherein the step of removing the peripheral portion from the donor substrate (1) is carried out after the donor substrate has been at least partly thinned.

6. The method according to one of Claims 1 to 5, wherein the donor substrate is bonded to the carrier substrate via a polymeric bonding layer.

7. The method according to Claim 6, wherein the width of the peripheral portion removed from the donor substrate is between 300 and 1000 µm, preferably between 300 and 500 µm from the edge of the donor substrate.

8. The method according to one of Claims 1 to 5, wherein the donor substrate is bonded to the carrier substrate via molecular adhesion.

9. The method according to Claim 8, wherein the width of the peripheral portion removed from the donor substrate is between 1 and 3 mm, preferably between 2 and 3 mm from the edge of the donor substrate.

10. The method according to one of Claims 1 to 9, wherein the removal of the peripheral portion comprises:
    - placing the donor substrate on a carrier that is rotatably movable about a first axis;
    - machining the donor substrate using an abrasive wheel rotating about a second axis parallel to the first axis, the abrasive wheel further being driven in translation along the second axis.

11. The method according to one of Claims 1 to 9, wherein the removal of the peripheral portion comprises:
    - placing the donor substrate on a carrier that is rotatably movable about a first axis;
    - machining the donor substrate using an abrasive wheel rotating about a second axis perpendicular to the first axis.

12. The method according to one of Claims 1 to 11, further comprising a step of polishing the donor substrate after the removal of the peripheral portion.

13. The method according to one of Claims 1 to 12, wherein the donor substrate comprises a piezoelectric material or a semiconductor material.

14. The method according to one of Claims 1 to 13, wherein the thickness of the thinned donor substrate is between 10 and 100 µm, preferably between 10 and 50 µm.

15. The method according to one of Claims 1 to 13, wherein the carrier substrate comprises silicon, glass, quartz, sapphire, a ceramic, and/or polycrystalline aluminium nitride.

16. The method according to any one of Claims 1 to 15, wherein, before the bonding of the heterostructure to the receiver substrate, an intermediate layer is formed on the donor substrate and/or the receiver substrate.

17. The method according to Claim 16, wherein the intermediate layer comprises silicon oxide, silicon nitride, silicon oxynitride, aluminium nitride (AlN), and/or tantalum oxide (Ta_2O_5), or a stack of layers formed of at least two of said materials.

18. The method according to any one of Claims 1 to 17, wherein the receiver substrate comprise silicon, glass, quartz, sapphire, a ceramic, and/or polycrystalline aluminium nitride.

19. The method according to Claim 18, wherein the receiver substrate is a silicon substrate including a charge-trapping layer comprising polycrystalline silicon, silicon carbide, amorphous silicon and/or porous silicon.

20. The method according to one of Claims 1 to 19, wherein the carrier substrate and the receiver substrate comprise materials exhibiting a difference in coefficient of thermal expansion smaller than or equal to 5% in terms of absolute value.

21. The method according to Claim 20, wherein the carrier substrate and the receiver substrate are formed of one and the same material.

22. The method according to one of Claims 1 to 21, wherein the thickness of the transferred layer is between 30 nm and 1.5 µm.