Claims

1. A composite structure for manufacturing microelectronic components comprising a single-crystalline thin film, arranged on a support substrate made of polycrystalline silicon carbide, said support substrate having, on each of its faces, a preferential crystalline orientation according to which:

- a texture coefficient C_{422} is less than 40%, and
- the sum of texture coefficients $C_{220}+C_{200}+C_{400}$ is greater than 50%, preferably greater than 80%.

2. The composite structure according to claim 1, wherein the support substrate has an electrical resistivity less than or equal to 10 mOhm.cm, preferably less than or equal to 5 mOhm.cm, more preferably less than or equal to 3 mOhm·cm.

3. The composite structure according to one of the preceding claims, wherein the support substrate is nitrogen-doped with a concentration, measured by secondary ion mass spectroscopy, of greater than or equal to $5.0x10^{19}$ atoms/cm^3, preferably greater than or equal to $1.0x10^{20}$ atoms/cm^3, even more preferentially greater than or equal to $1.5x10^{20}$ atoms/cm^3, or preferably greater than or equal to $3x10^{20}$ atoms/cm^3;

4. The composite structure according to one of the preceding claims, wherein the texture coefficient C_{422} is less than 20%, preferentially less than 15%, or even preferentially less than 10%.

5. The composite structure according to one of the preceding claims, wherein the sum of the texture coefficients $C_{200}+C_{400}$ is greater than 1%, preferably greater than 2%, even more preferentially greater than 5%.

6. The composite structure according to one of the preceding claims, wherein the thin film is composed of silicon carbide.

7. The composite structure according to one of claims 1 to 5, wherein the thin film is composed of gallium nitride.

8. The composite structure according to one of claims 1 to 5, wherein the thin film is composed of gallium oxide.

9. The composite structure according to one of claims 1 to 5, wherein the thin film is composed of diamond.

10. The composite structure according to one of the preceding claims, comprising a continuous or discontinuous intermediate layer, arranged between the thin film and the support substrate and composed of at least one metallic or semi-conductive material.

11. The composite structure according to claim 10, wherein the intermediate layer is composed of silicon, silicon carbide, tungsten, and/or titanium.

12. The composite structure according to one of the preceding claims, wherein the support substrate has a thickness of between 50 microns and 650 microns.

13. The composite structure according to one of the preceding claims, comprising an electronic component on and/or in the thin film and optionally comprising an electrical contact at the rear face of the support substrate.

14. A method for manufacturing a composite structure comprising a single-crystalline thin film disposed on a support substrate made of polycrystalline silicon carbide, the manufacturing method comprising the following steps:

a) providing a support substrate made of polycrystalline silicon carbide having, on each of its faces, a preferential crystalline orientation according to which:

- a texture coefficient C_{422} is less than 40%, and
- the sum of texture coefficients $C_{220}+C_{200}+C_{400}$ is greater than 50%, preferably greater than 80%,

b) providing a donor substrate made of a single-crystalline material,

c) transferring a thin film from the donor substrate onto the support substrate.

15. The manufacturing method according to claim 14, wherein the transfer step c) comprises:

c1) forming a buried brittle plane in the donor substrate, delimiting the thin film between said buried brittle plane and a front face of the donor substrate,

c2) assembling, by molecular adhesion bonding, the donor substrate to the support substrate, directly or via an intermediate layer,

c3) separating along the buried brittle plane to result in transfer of the thin film onto the support substrate.

16. The manufacturing method according to claim 15, wherein step c2) comprises, before the assembly of the two substrates:

- forming an intermediate layer on the donor substrate, before or after step c1), and/or
- forming an intermediate layer on the support substrate,

the intermediate layer being formed of at least one metallic or semi-conductive material, chosen from silicon, silicon carbide, tungsten and titanium.

17. The manufacturing method according to one of claims 14 to 16, further comprising the creation of electronic components on and/or in the thin film of the composite structure.

18. The manufacturing method according to claim 17, wherein the creation of electronic components comprises in particular a homoepitaxy or heteroepitaxy step on the thin film.