

## CLAIMS

1. A Process for fabricating a semiconductor-on-insulator substrate for radiofrequency applications, comprising the following steps:
  - 5       - providing a p-doped semiconductor donor substrate ~~(1)~~,
  - forming a sacrificial layer ~~(13)~~ on the donor substrate,
  - implanting atomic species through said sacrificial layer ~~(13)~~, so as to form, in the donor substrate ~~(1)~~, a weakened area ~~(11)~~ defining a semiconductor thin layer ~~(12)~~ to be transferred,
  - 10       - removing the sacrificial layer ~~(13)~~ from the donor substrate ~~(1)~~ after said implantation,
  - providing a semiconductor carrier substrate ~~(2)~~ having an electrical resistivity greater than or equal to 500  $\Omega$ .cm,
  - forming an electrically insulating layer ~~(20)~~ on the carrier substrate ~~(2)~~,
  - 15       - bonding the donor substrate ~~(1)~~ to the carrier substrate ~~(2)~~, the semiconductor thin layer ~~(12)~~ and the electrically insulating layer ~~(20)~~ being at the bonding interface,
  - detaching the donor substrate ~~(1)~~ along the weakened area ~~(11)~~ so as to transfer the semiconductor thin layer ~~(12)~~ from the donor substrate ~~(1)~~ to the carrier substrate ~~(2)~~.
- 20       2. The process according to Claim 1, wherein forming the sacrificial layer ~~(13)~~ comprises oxidizing the material of the donor substrate ~~(1)~~.
- 25       3. The Process according to either of Claims 1 and 2, wherein removing the sacrificial layer ~~(13)~~ comprises wet-etching said layer ~~(13)~~.
- 30       4. The Process according to one of Claims 1 to 3, wherein removing the sacrificial layer ~~(13)~~ furthermore comprises removing a surface portion of the thin layer ~~(12)~~ to be transferred from the donor substrate.
- 35       5. The Process according to one of Claims 1 to 4, wherein the donor substrate ~~(1)~~ is boron-doped.
6. The Process according to one of Claims 1 to 5, wherein forming the electrically insulating layer ~~(20)~~ comprises depositing an oxide on the carrier substrate ~~(2)~~.
7. The Process according to one of Claims 1 to 5, wherein forming the electrically insulating layer ~~(20)~~ comprises oxidizing the carrier substrate ~~(2)~~.

8. The Pprocess according to one of Claims 1 to 7, wherein the electrically insulating layer-~~(20)~~ has a thickness between 10 and 150 nm.

9. The Pprocess according to one of Claims 1 to 8, wherein the transferred  
5 semiconductor layer-~~(10)~~ has a thickness between 4 and 100 nm.