

CLAIMS

1. A Pprocess for fabricating a semiconductor-on-insulator substrate for radiofrequency applications, comprising the following steps:

5 - forming a donor substrate ~~(1)~~ through epitaxial growth of an undoped semiconductor layer ~~(101)~~ on a p-doped semiconductor seed substrate ~~(100)~~,

 - forming an electrically insulating layer ~~(10)~~ on the undoped epitaxial semiconductor layer ~~(101)~~,

10 - implanting ion species through said electrically insulating layer ~~(10)~~, so as to form, in the undoped epitaxial semiconductor layer ~~(101)~~, a weakened area ~~(11)~~ defining a semiconductor thin layer ~~(12)~~ to be transferred,

 - providing a semiconductor carrier substrate ~~(2)~~ having an electrical resistivity greater than or equal to 500 Ω .cm,

15 - bonding the donor substrate ~~(1)~~ to the carrier substrate ~~(2)~~ via the electrically insulating layer ~~(10)~~,

 - 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 Pprocess according to Claim 1, wherein the undoped epitaxial semiconductor layer ~~(101)~~ has a thickness between 10 and 1000 nm.

 3. The Pprocess according to either ~~of Claims 1 and-or Claim~~ 2, wherein the seed substrate ~~(100)~~ is boron-doped.

25 4. The Pprocess according to one of Claims 1 to 3, wherein forming the electrically insulating layer ~~(10)~~ comprises thermally oxidizing the material of the undoped epitaxial semiconductor layer ~~(101)~~.

30 5. The Pprocess according to one of Claims 1 to 4, wherein forming the donor substrate ~~(1)~~ comprises forming, between the seed substrate ~~(100)~~ and the undoped epitaxial semiconductor layer ~~(101)~~, an intermediate layer ~~(102)~~ made of a material different from the material of the epitaxial semiconductor layer ~~(101)~~, chosen so as to allow selective etching of the undoped epitaxial layer ~~(101)~~ with respect to the intermediate layer ~~(102)~~.

35 6. The Pprocess according to Claim 5, wherein the material of the undoped epitaxial layer ~~(101)~~ is silicon and the material of the intermediate layer ~~(102)~~ is silicon-germanium with a germanium content less than or equal to 30%.

7. The Process according to either ~~of Claims 5 and or Claim~~ 6, comprising, after the detachment, selectively etching the remainder of the undoped epitaxial semiconductor layer ~~(101)~~ with respect to the intermediate layer ~~(102)~~ and then selectively etching the
5 intermediate layer ~~(102)~~ with respect to the seed substrate ~~(100)~~, and forming a new donor substrate ~~(1)~~ by successively forming, on said seed substrate ~~(100)~~, a new intermediate layer ~~(102')~~ and a new undoped epitaxial layer ~~(101')~~.
8. The Process according to one of Claims 1 to 7, wherein the electrically
10 insulating layer ~~(10)~~ has a thickness between 10 and 150 nm.
9. The Process according to one of Claims 1 to 8, wherein the transferred semiconductor layer ~~(12)~~ has a thickness between 4 and 300 nm.