including the formation of a fragile plane buried in a LiTaO3 donor substrate by introducing light species such as hydrogen and/or helium, direct bonding of this donor substrate onto a silicon support substrate, and separation at the buried fragile plane so as to transfer a LiTaO3 surface layer onto Si. It is known that the surface layer still has defects and light species in its thickness after it has been transferred. Therefore, to heal this layer, it is advantageous to anneal at a suitable temperature range to allow for the defects to be healed and the light species to be released without damaging the qualities of the thin layer transferred or the mechanical strength of the heterostructure. By way of example, the suitable temperature range to choose for a LiTaO3 layer would be between 400 °C and 600 °C.

Again, the issue is that LiTaO3/Si heterostructures cannot handle these high thermal budgets, given the very significant difference in the coefficient of thermal expansion between the materials LiTaO3 and Si.

OBJECT OF THE INVENTION

Embodiments of the invention therefore seek to provide a structure and a manufacturing method overcoming the drawbacks of the prior art. More specifically, embodiments of the invention seek to provide a composite structure, comprising a useful layer arranged on a support at an interface and capable of

handling thermal budgets high enough to reinforce this interface or at least partially heal the defects on the surface layer or to develop certain components.

BRIEF DESCRIPTION OF THE INVENTION

An aspect of the present invention provides a composite structure for an acoustic wave device comprising a heterostructure including:

- a useful layer of piezoelectric material, having a first and a second face, the first face being arranged at a first bonding interface on a support substrate having a lower coefficient of thermal expansion than that of the useful layer

The composite structure is remarkable in that it comprises a functional layer an entire surface of which is arranged at a second bonding interface on the second face of the useful layer and having a coefficient of thermal expansion less than that of the useful layer.

The composite structure according to embodiments of the invention thus is able to handle a temperature higher than a limit temperature above which the heterostructure deteriorates or breaks in the absence of the functional layer. The composite structure thus makes it possible to apply heat treatments required to consolidate the first bonding interface of the heterostructure or to heal any defects on the useful layer. It would not have been possible to apply these heat treatments directly to the heterostructure due to

heterostructure is less than 1000 mJ/m2, to enable its disassembly

- The functional layer comprises at least one first local opening enabling access to at least one first part of the second face of the useful layer and said first part of the second face of the useful layer comprises metal elements forming an acoustic wave device, in particular a SAW device

- The functional layer comprises at least one first local opening enabling access to at least one first part of the second face of the useful layer

- The support substrate comprises at least one second local opening, at least partially facing the first local opening and enabling access to at least one second part of the first face of the useful layer

- Said first and second parts respectively of the second and first faces of the useful layer comprise metal elements forming an acoustic wave device, in particular a BAW device

- The functional layer and/or the support substrate comprise(s) metal contacts and/or electronic devices electrically connected to metal elements arranged on the useful layer

Another aspect of the present invention provides a method of manufacturing a composite structure for an acoustic wave device including a step of providing a