interface with the the carrier substrate beneath. This phenomenon is called "rattle".

To avoid these parasitic modes, it is known practice to make the surface of the piezoelectric layer located at the interface with the electrically insulating layer rough enough to allow the parasitic waves to be reflected in all directions (scatter effect) and prevent their transmission into the substrate.

Given the wavelength in question, the roughness of the surface of the piezoelectric layer is very high, of the order of a few μm.
Producing the substrate entails bonding the rough surface of the piezoelectric layer, potentially covered with the electrically insulating layer, to the carrier substrate.
However, to ensure good adhesion between the piezoelectric layer and the carrier substrate despite such roughness, the current process requires a large number of successive steps, which makes it lengthy and expensive.

SUMMARY OF THE INVENTION

Embodiments of the present invention aim to overcome these limitations of the prior art by providing a process for producing a substrate for a radiofrequency filter. In this way, it is possible to solve the problems that are currently encountered.

An aspect of the invention relates to a process for fabricating a substrate for a radiofrequency filter by joining a piezoelectric layer to a carrier substrate via an electrically insulating layer, the process comprising the steps of depositing the electrically insulating layer by spin coating an oxide belonging to the family of SOGs (spin-on glasses) on the surface of the piezoelectric layer to be joined to the carrier substrate, followed by an anneal for densifying said electrically insulating layer before joining, wherein the piezoelectric layer is joined to the carrier substrate at ambient temperature and a pressure lower than or equal to 5 mTorr.

CLAIMS

1. A process for fabricating a substrate for a radiofrequency filter by joining a piezoelectric layer to a carrier substrate via an electrically insulating layer, the process comprising the steps of depositing the electrically insulating layer by spin coating an oxide belonging to the family of SOGs (spin-on glasses) on the surface of the piezoelectric layer to be joined to the carrier substrate, followed by an anneal for densifying said electrically insulating layer before joining, wherein the piezoelectric layer is joined to the carrier substrate at ambient temperature and a pressure lower than or equal to 5 mTorr.

2. The process according to claim 1, wherein the thickness of the piezoelectric layer is greater than 5 µm, preferably greater than 10 µm.

3. The process according to claim 1 or 2, wherein the surface of the piezoelectric layer to be joined to the carrier substrate has a predetermined roughness suitable for reflecting a radiofrequency wave.

4. The process according to claim 3, wherein the predetermined roughness is greater than 1 µm, preferably greater than 3 µm.

5. The process according to any one of the preceding claims, wherein the carrier substrate is made of silicon material.

6. The process according to claim 5, wherein the carrier substrate made of silicon material comprises a trapping layer towards the interface to be joined with the piezoelectric layer.

7. The process according to one of the preceding claims, wherein the piezoelectric layer is made of lithium niobate or lithium tantalate.