CLAIMS

1. Surface acoustic wave resonator, SAW, (100) comprising at least:

- one substrate (102);
- one layer of piezoelectric material (108) arranged on the substrate (102);
- one first attenuation layer (112) arranged between the substrate (102) and the layer of piezoelectric material (108) and/or, when the substrate (102) comprises at least two separate layers (104, 106), one second attenuation layer (114) arranged between the two layers (104, 106) of the substrate (102);

and wherein the attenuation layer or layers (112, 114) are able to diffuse or absorb at least one portion of parasitic acoustic waves and comprise porous silicon and/or polysilicon in which are arranged doped regions that render the attenuation layer or layers (112, 114) heterogeneous.

2. SAW resonator (100) according to claim 1, wherein the piezoelectric material comprises LTO and/or LNO and/or quartz and/or Langatate and/or Langasite and/or Langanite.

3. SAW resonator (100) according to one of the preceding claims, wherein the regions are doped differently from the rest of the first attenuation layer (112) and/or of the second attenuation layer (114).

4. SAW resonator (100) according to one of the preceding claims, wherein the first attenuation layer (112) and/or the second attenuation layer (114) comprises porosities (116) and/or cavities (118) and/or at least one face at least partially rough.

5. SAW resonator (100) according to claim 4, wherein, when the first attenuation layer (112) and/or the second attenuation layer (114) comprises porosities

(116) and/or cavities (118), the porosities (116) and/or the cavities (118) of the first attenuation layer (112) and/or of the second attenuation layer (114) each have a substantially spherical or cylindrical shape.

6. SAW resonator (100) according to one of the preceding claims, wherein:

- the first attenuation layer (112) is separate from the substrate (102) and from the layer of piezoelectric material (108), or corresponds to a portion of the substrate (102), and/or
- the second attenuation layer (114) is separate from the two layers (104, 106) of the substrate (102), or corresponds to a portion of at least one of the two layers (104, 106) of the substrate (102).

7. SAW resonator (100) according to one of the preceding claims, further comprising electrodes (110) arranged on the layer of piezoelectric material (108).

8. Method for producing a surface acoustic wave resonator, SAW, (100), comprising at least the implementation of the following steps:

- production of a first attenuation layer (112) on a substrate (102) and/or, when the substrate (102) comprises at least two separate layers (104, 106), of a second attenuation layer (114) between the two layers (104, 106) of the substrate (102), the attenuation layer or layers (112, 114) comprising porous silicon and/or polysilicon;
- production of a layer of piezoelectric material (108) on the substrate (102) or, when the first attenuation layer (112) is present on the substrate (102), on the first attenuation layer (112);

and wherein the production of the first attenuation layer (112) and/or of the second attenuation layer (114) comprises a doping of regions of porous silicon and/or polysilicon of the first attenuation layer (112) and/or of the second attenuation layer (114) that renders the attenuation layer or layers (112, 114) heterogeneous, and wherein the

attenuation layer or layers (112, 114) are able to diffuse or absorb at least one portion of parasitic acoustic waves.

9. Method according to claim 8, wherein the production of the first attenuation layer (112) and/or of the second attenuation layer (114) comprises the implementation of a deposit of at least one porous material and/or the production of cavities (118) by the implementation of steps of photolithography and etching and/or the implementation of a deposit of material on a rough surface, forming the first attenuation layer (112) and/or the second attenuation layer (114), and/or the implementation of a treatment that form roughnesses on at least one face of the first attenuation layer (112) and/or of the second attenuation layer (114).