

Novel acoustic wave device and filter for its use in high frequency applications

An acoustic wave device with one or more dielectric compensating layers that compensates the spurious signals by substantially temperature-independent nonlinearities occurring within the device has been developed. A direct application of this device has been the development of a novel acoustic filter. Partners to further develop the system and/or to establish commercial agreements with technical cooperation are sought.

The Challenge

Acoustic filter technologies based on piezoelectric materials play a key role in wireless communication because they guarantee spectral integrity of Radio Frequency (RF) signals. SAW and BAW filters are commonly used in the mobile phone market and new technologies and materials are constantly needed to achieve important improvements in wireless products. One of the problems of these technologies (SAW and BAW) are the nonlinearities that are inherent of the materials used in the resonators devices. The properties of the materials used depend of the electrical or acoustic magnitudes present. The elasticity of the piezoelectric material and the self-heating effects are the principal causes of the acoustic devices nonlinearities.

The conventional temperature compensation techniques (the compensating layer has a temperature coefficient opposite to the piezoelectric layer), intended to compensate frequency detuning; also contribute to a certain compensation of the extrinsic temperature-induced nonlinearities.

The Technology

In contrast, this offer proposes an acoustic device made of one or more dielectric compensating layers to compensate the spurious signals generated, by intrinsic substantially temperature-independent nonlinearities, when applying an input signal at the electrodes. These nonlinearities are intrinsic to the nonlinear elastic properties of the materials used to fabricate the acoustic device.

This technology comprises an acoustic device formed by two or more electrodes, one or more active layers made of piezoelectric material and compensation layers to counteract the spurious signals generated by nonlinearities occurring within the acoustic device.

Innovative advantages

- A novel way to cancel and/or mitigate nonlinearities in acoustic devices by a means of a compensating layer.
- A solution based on mere physics phenomena, in contrast to the device built in solutions currently in use, like the anti-parallel connection.

Current stage of development

The technology is a proof of concept available for testing

Applications and Target Market

The main application is in the field of microwave filters. More specifically, the offer proposed a solution to cancel and/or mitigate the spurious signals produced in BAW or SAW filters. Other applications are in any field where propagation through nonlinear-media is being used, such as power acoustic transducers, mechanic sensors, lab-on-a-chip transducers", etc.

Reference number

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New system to mitigate nonlinearities in acoustic devices



A solution based on mere physics phenomena

Business Opportunity
Technology available for licensing with technical cooperation

Patent Status
PCT application filed

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