

Influence of Bragg Reflectors Pairs on Resonance Characteristics of Solidly Mounted Resonators

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Abstract : The solidly mounted resonator (SMR) is a bulk acoustic wave-based device consisting of a piezoelectric layer sandwiched between two electrodes upon Bragg reflectors, which then are attached to a substrate. To transform the effective acoustic impedance of the substrate to a near zero value, the Bragg reflectors are composed of alternating high and low acoustic impedance layers of quarter-wavelength thickness. In this work presents the design and investigation of acoustic Bragg reflectors (ABRs) for solidly mounted bulk acoustic wave resonators through analysis and simulation. This performance of the resonator is analyzed using 1D Mason modeling. The performance parameters are the effect of Bragg pairs number on transmissivity, reflectivity, insertion loss, the electromechanical and quality factor of the 5GHz operating resonator.

Keywords : bragg reflectors, SMR, insertion loss, quality factor

Conference Title : ICSMS 2024 : International Conference on Sensors for Medical Systems

Conference Location : Bangkok, Thailand

Conference Dates : March 04-05, 2024