

Genetic Algorithm Optimization of Microcantilever Based Resonator

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Abstract : Micro Electro Mechanical Systems (MEMS) resonators have shown the potential of replacing quartz crystal technology for sensing and high frequency signal processing applications because of inherent advantages like small size, high quality factor, low cost, compatibility with integrated circuit chips. This paper presents the optimization and modelling and simulation of the optimized micro cantilever resonator. The objective of the work is to optimize the dimensions of a micro cantilever resonator for a specified range of resonant frequency and specific quality factor. Optimization is carried out using genetic algorithm. The genetic algorithm is implemented using MATLAB. The micro cantilever resonator is modelled in CoventorWare using the optimized dimensions obtained from genetic algorithm. The modeled cantilever is analysed for resonance frequency.

Keywords : MEMS resonator, genetic algorithm, modelling and simulation, optimization

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