

## عنوان مقاله:

Design and Simulation of a Dual-Mode Resonant Temperature sensor Based on MEMS Technology

## محل انتشار:

فصلنامه ادوات مخابراتی، دوره 8، شماره 4 (سال: 1398)

تعداد صفحات اصل مقاله: 5

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## خلاصه مقاله:

In this paper, a dual-mode (DM) micromechanical elliptical ring resonator for use in temperature sensing is reported. The proposed resonator is made of single crystal silicon and works based on beat frequency (fb). In the designed sensor, temperature coefficient of beat frequency (TCfb) will be increased significantly by minimizing the fb and provides better temperature sensitivity. This proposed device was designed and simulated by COMSOL Multiphysics software. By engineering the device geometry, we introduce two adjacent resonant frequencies which produce very small fb in the range of ۲ kHz. The device shows TCf1 of about ۴۴ ppm/°C and TCf2 of ۵ ppm/°C. Combination of small fb and large  $\Delta TCf$ , present temperature coefficient of beat frequency (TCfb) about ۱۱۲۰۰۰ ppm/°C which has approximately ۷۵ improvement in TCfb compared to previous demonstrated DM resonators.

## کلمات کلیدی:

Dual-mode (DM) resonator, Beat frequency, Microelectromechanical Systems, MEMS, Temperature sensing, Dual-mode (DM) resonator

## لینک ثابت مقاله در پایگاه سیویلیکا:

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