Temperature Sensing by Using Film Bulk Acoustic Resonator at 2.4GHz band

高曜煌,林炯宏
Communication Engineering
Engineering
yhkao@chu.edu.tw

Abstract

A four-layered Film Bulk Acoustic Resonator (FBAR) with AI/AlN/SiNx/Au composite structure was fabricated. The FBAR is composed of on a surface micromachined cantilever that is released by wet etching the copper scarification layer. The temperature coefficient (TC) of resonant frequency of -34.5 ppm/oC in the temperature range from 10 and 80 oC at 2.48 GHz is obtained. Using this resonator, an oscillator was constructed for temperature sensing. The temperature can be detected easily by measuring the shift of oscillation frequency. The TC of resonant frequency of oscillator is almost the same as that of the resonator.

Keyword：Bulk Acoustic Wave, AlN thin film, Resonator, Temperature Sensing, and TC