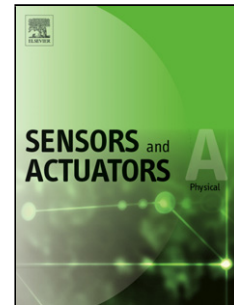


## Accepted Manuscript

Title: Design of Resonance Based DC Current Sensor Using BAW Quartz Resonators

Authors: Sameera Pisupati, Divija Kundukoori, Nithin Mekala, Suresh Kaluvan, Haifeng Zhang



PII: S0924-4247(17)31082-8  
DOI: <https://doi.org/10.1016/j.sna.2018.01.006>  
Reference: SNA 10561

To appear in: *Sensors and Actuators A*

Received date: 8-6-2017  
Revised date: 28-11-2017  
Accepted date: 2-1-2018

Please cite this article as: Pisupati S, Kundukoori D, Mekala N, Kaluvan S, Zhang H, Design of Resonance Based DC Current Sensor Using BAW Quartz Resonators, *Sensors and Actuators: A Physical* (2018), <https://doi.org/10.1016/j.sna.2018.01.006>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Design of Resonance Based DC Current Sensor Using BAW Quartz Resonators

Sameera Pisupati, Divija Kundukoori, Nithin Mekala  
Suresh Kaluvan and Haifeng Zhang

Smart Structures and Systems Laboratory,  
Department of Engineering Technology,  
University of North Texas, Denton, TX 76203.

\*Corresponding Author: haifeng.zhang@unt.edu

## Highlight

- A novel DC-current sensor using quartz crystal is proposed in this paper.
- The working principle of sensor (i.e Stiffening a BAW quartz crystal utilizing SMA Wire ) is unique and first of its kind.
- The current flow in the SMA wire is tuning the resonance frequency of BAW quartz crystal
- The proposed principle is very much useful for low electric current measurement application.

## Abstract

A novel approach is attempted to measure DC current in the range of 0 – 0.7A in this paper. The proposed current sensing system is designed using an AT-cut BAW quartz resonator sandwiched at the center of the rectangular beam. The SMA wire bonded over the rectangular beam changes its shape with the change in input current. The quartz crystal resonator is maintained at first mode resonance frequency using a closed loop resonator electronics. The electric current change in the

Download English Version:

<https://daneshyari.com/en/article/7133643>

Download Persian Version:

<https://daneshyari.com/article/7133643>

[Daneshyari.com](https://daneshyari.com)