

Analysis Of MEMS Accelerometer Sensor Using The Taguchi Optimization Method.

Nurul Izati Binti Md. Johan

Universiti Teknikal Malaysia Melaka (UTeM), Faculty of Electronics & Computer Engineering

Malaysia

Abstract

A successful and coherent operation of micro - accelerometers, which has been used in various applications for safety purposes like the airbag deployment systems used in vehicles. This can only be attained when the sensitivity requirement is met. The project is about the analysis of the MEMS accelerometer sensor by using the Taguchi optimization method. The sensitivity of the accelerometer and the structure of the accelerometer, beam width, beam length, mass width and mass length of the device are analyzed theoretically and the optimization using Taguchi method is used to increase the sensitivity of the accelerometer. In Taguchi, the Analysis of Variance (ANOVA) tool is used to analyze the relation between input and output. An attempt has been made to obtain the major input parameter influence towards the sensitivity of the device. The results show that the beam width gives more impact compared to others parameter. The final optimized result obtained is simulated by using COMSOL Multiphysics to verify with the theoretical value. The results from the Taguchi's optimization method show that the sensitivity of the device is improved.

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