

# Smart Flexible Substrate-BASED Accelerometer Using Semi-cylindrical Chamber and Filled with Xenon Gas

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## Abstract

This paper proposes a new method to integrate the RFID tag with the thermal bubble accelerometer on the plastic substrate and to make it be a wireless acceleration sensor. The key technology is to integrate both a thermal bubble accelerometer and a RFID antenna on the same substrate, such that the accelerometer is very convenient for fabrication and usage. In this paper the heaters as well as the thermal sensors are evaporated on the surface of the flexible substrate without the traditional floating structure. Thus the structure is much simpler, cheaper and reliable in large acceleration impact condition without broken. In addition, the shape of the chamber is changed as a semi-cylindrical one instead of the conventional rectangular type. Furthermore, the molecular weight of the proposed xenon gas is much larger than carbon dioxide, thus the response speed can be increased. Comparisons of sensitivity and response time are made; one can see the performances of the proposed new design are better.

Keyword : Substrate-BASED, active RFID tag