

Diaphragm-type Acoustic Sensor Based on Sputtered Piezoelectric Thin Film

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(Received August 25, 2004; accepted September 13, 2005)

Key words: acoustic sensor, diaphragm, piezoelectric thin film, sound pressure level, frequency response

In this paper, we report the development of a low-cost acoustic sensor using piezoelectric ZnO thin film deposited onto a thin stainless-steel diaphragm. The details of the diaphragm and the mechanical assembly of the sensor are given. Reactive magnetron sputtering has been used for the preparation of piezoelectric ZnO film. Studies on the characterization of the ZnO films for the confirmation of their piezoelectric behavior are included. Observations on the performance of the acoustic sensor are presented, which include frequency response characteristics, sensitivity and linearity. In comparison with general acoustic sensors, our acoustic sensor is attractive in view of its low cost, lower weight and simpler fabrication methods.

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