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Design and Simulation of MEMS-Based Capacitive Pressure Sensors

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Abstract : MEMS sensor have gained popularity in automotive, biomedical, and industrial applications. In this paper, the design and simulation of conventional, slotted, and perforated MEMS capacitive pressure sensor is proposed. Polysilicon material is used as diaphragm material that deflects due to applied pressure. Better sensitivity is the main advantage of conventional pressure sensor as compared with other two sensors and perforated pressure sensor achieves large operating pressure range. The proposed MEMS sensor demonstrated with diaphragm length 50um, gap depth 3um is being modelled. The simulation is carried out for different types of MEMS capacitive pressure sensor using COMSOL Multiphysics and Coventor ware.

Keywords : MEMS, conventional pressure sensor, slotted and perforated diaphragm, COMSOL multiphysics, coventor ware
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