

A MEMS Condenser Microphone for Consumer Applications

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Abstract

The MEMS microphone is also called microphone chip or silicon microphone. The pressure sensitive diaphragm is etched directly into a silicon chip by MEMS techniques and is usually accompanied with integrated preamplifier. Most MEMS microphones are variants of the condenser microphone design. The device consists of a polysilicon diaphragm suspended over a single crystal silicon backplate fabricated on silicon on insulator (SOI) wafers. The MEMS microphone has been successfully fabricated and tested in an anechoic chamber. The microphone is fabricated using a process that is compatible with inexpensive high volume production using unit processes that are currently used to fabricate inertial sensors. In this paper we discuss the COMSOL Multiphysics analysis of 5 different membrane structures of MEMS Microphone. As can be observed in figure 1. We also discuss about the sensitivity analysis of different membrane structures with respect to different pressures using COMSOL Multiphysics. In figure 2 we showcase the circuit diagram of the MEMS Microphone.

Figures used in the abstract

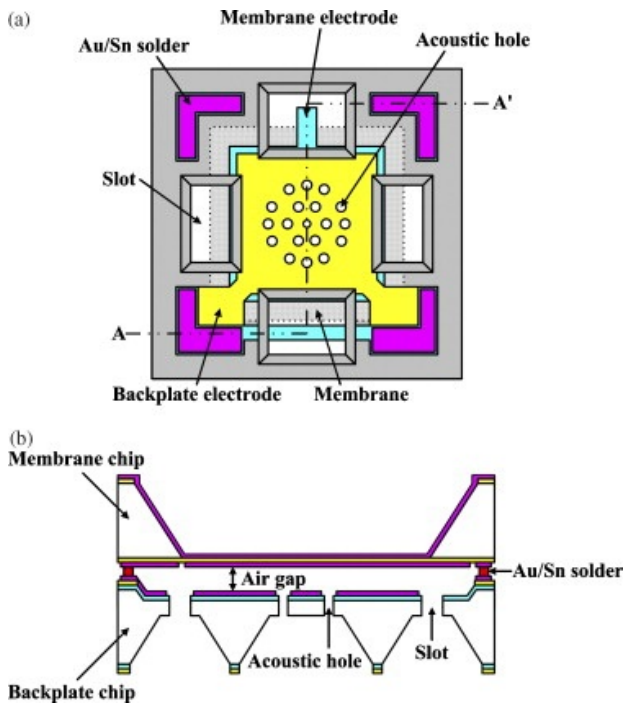


Figure 1: General diagram of the MEMS Microphone.

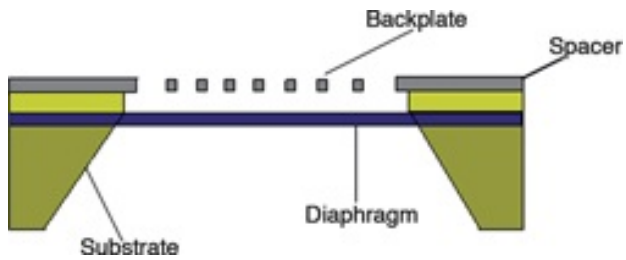


Figure 2: Structure diagram of MEMS Microphone