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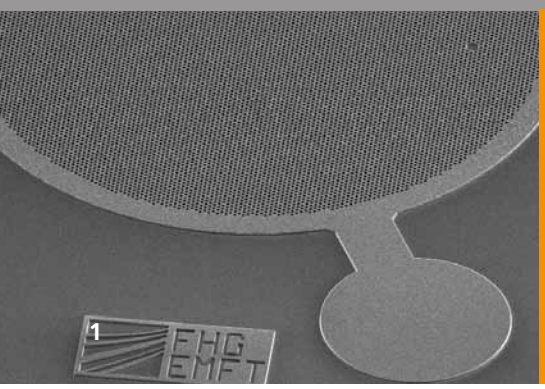
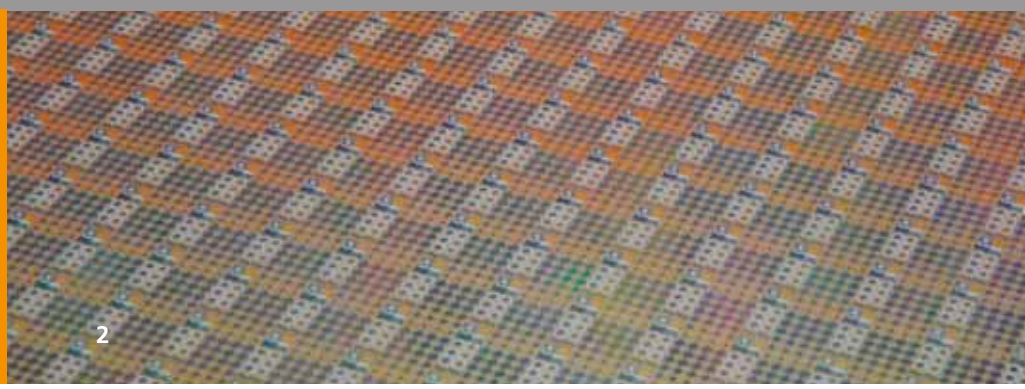
FRAUNHOFER RESEARCH INSTITUTION FOR MICROSYSTEMS AND SOLID STATE TECHNOLOGIES EMFT





1 *SEM microphotograph showing a back plate with acoustic holes*
2 *200 mm wafer with MEMS microphones after realizing metallic contact on the bending membrane and perforated back plate*

MEMS MICROPHONE

Introduction

Microphones – transducers converting acoustic energy into electrical signals – are widely used in different domains such as consumer electronics, medical applications and automotive. MEMS technology (Micro-Electro-Mechanical Systems) opens up new opportunities to manufacture a cost-efficient, miniaturised capacitive microphone with improved sensitivity at low power consumption.

Description

A novel, all silicon-based MEMS microphone will be developed at Fraunhofer EMFT in collaboration with our partners EPCOS, Müller BBM and Munich University of Applied Sciences. The completed device consists of a capacitive microphone and an appropriate ASIC. The two main objectives of the project are to miniaturize the size of the microphone and to realize a 3D-integration of microphone and the associated ASIC at a low cost level.

Technology

The complete design, which is needed to realize a capacitive MEMS microphone, is done inhouse. Almost all process steps developed for the MEMS microphone are performed in a clean room class 100 at Fraunhofer EMFT, compatible with standard CMOS IC technology. Micro bumps or the SLID-technology (Solid-Liquid-Inter-Diffusion) will be used to stack the microphone and the ASIC chip in order to reduce the package size and the volume of the final device.

Acknowledgement

The above described MEMS-microphone project is sponsored by the Bavarian Ministry of Economic Affairs, Infrastructures,Transport and Technology.

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