NETWORK of EXCELLENCE
DESIGN FOR MICRO & NANO MANUFACTURE
PATENT (DfMM)

DfMM NoE PATENT

www.patent-dfmm.org

MEMS test structures for material, process and reliability characterization

Purpose:

To build the WP3 offer on MEMS test structures (TS) usable for material and process characterization, but also for evaluating and preventing specific failure mechanisms. New TS for silicon and SOI technologies will be designed and processed.

Further develop integration of research amongst PATENT partners, Round Robin studies (at partners) on MEMS material, process parameters and failure mechanisms.

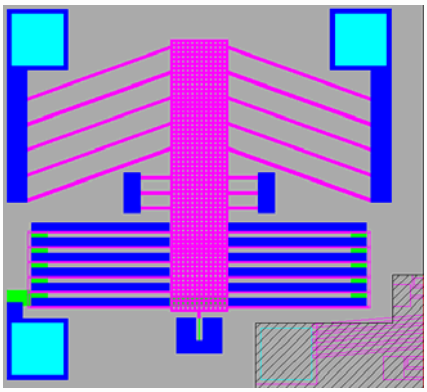
Partners involved

IMT, HWU, IEF, QinetiQ, IMS, POLIMI, WUT, BUTE, CEA-LETI, LAAS

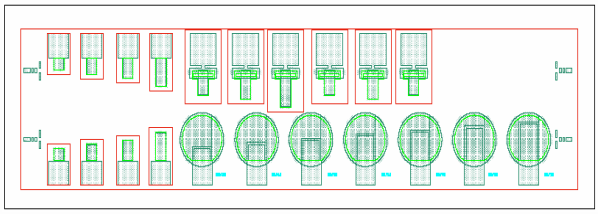
Results (Feb.15, 2006)

Design of new TS:

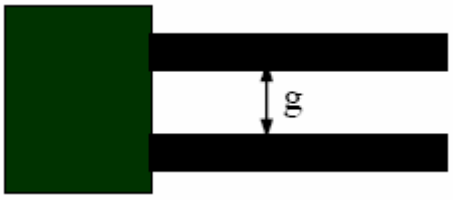
- Based on electrostatic and electro-thermal actuation (POLIMI)
- M-type and poly Si membranes (IMS)
- SOI test devices – resonators (IEF-UPS)



TS for electro-thermal actuation (POLIMI)



A series of M-Test structures for combined E and s measurement (IMS)



SOI test structure: Beam resonators (IEF-UPS)

Offer to industry

- Designing & Processing TS for MEMS technologies
- Testing TS and working in a virtual laboratory approach, with different testing operations performed to different partners
- Extracting data on material parameters and about the effects of processing conditions on material properties
- Studying failure mechanisms and proposing corrective actions
- Performing reliability assessment by processing
- data collected by using TS, in order to be able to deliver reliability data about a batch of MEMS

Contact

Marius Bazu (mbazu@imt.ro)

Project status: Starting in November 2005