

# High End Acceleration Sensors (HEB)

As part of the "HEB" research project, new high-resolution capacitive MEMS acceleration sensors were developed at the CiS Research Institute. Basic research concepts were implemented in cost-efficient semiconductor processes.

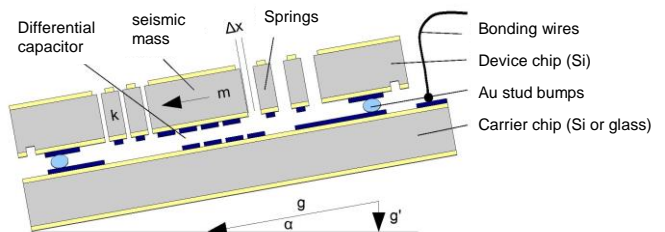
Features of the sensors are an increased seismic mass, a laterally arranged differential capacitor and a hermetic package.

The first demonstrator modules have been built and successfully tested.

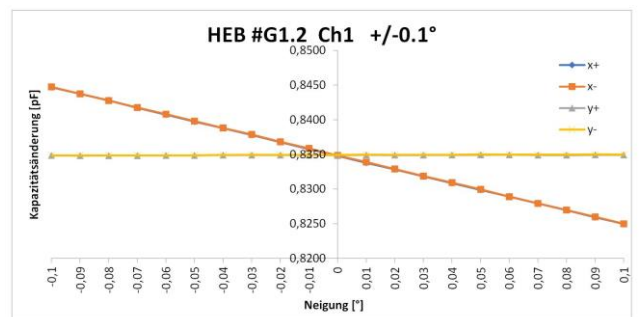
## CHARACTERISTICS

- Deflections of the spring-mass system: typ. 18  $\mu\text{m/g}$
- Resonant frequency: typ. 115 Hz
- Sensitivities:  
Si/Si: 2.2 pF/g (38 aF/0,001°)  
Glass/Si: 5.5 pF/g (96 aF/0,001°)
- Bias stabilities:  
Si/Si: 12.3  $\mu\text{g}$  (0.0007°)  
Glass/Si: 5.4  $\mu\text{g}$  (0.0003°)

These high-resolution acceleration sensors are suitable for inclination and leveling measurements as well as condition monitoring in a wide range of applications.



Principle sketch of the capacitive high-end MEMS acceleration sensor in cross-section as a single-chip structure



Example characteristic curve of a glass/silicon HEB single sensor in the range of  $\pm 0.1^\circ$



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