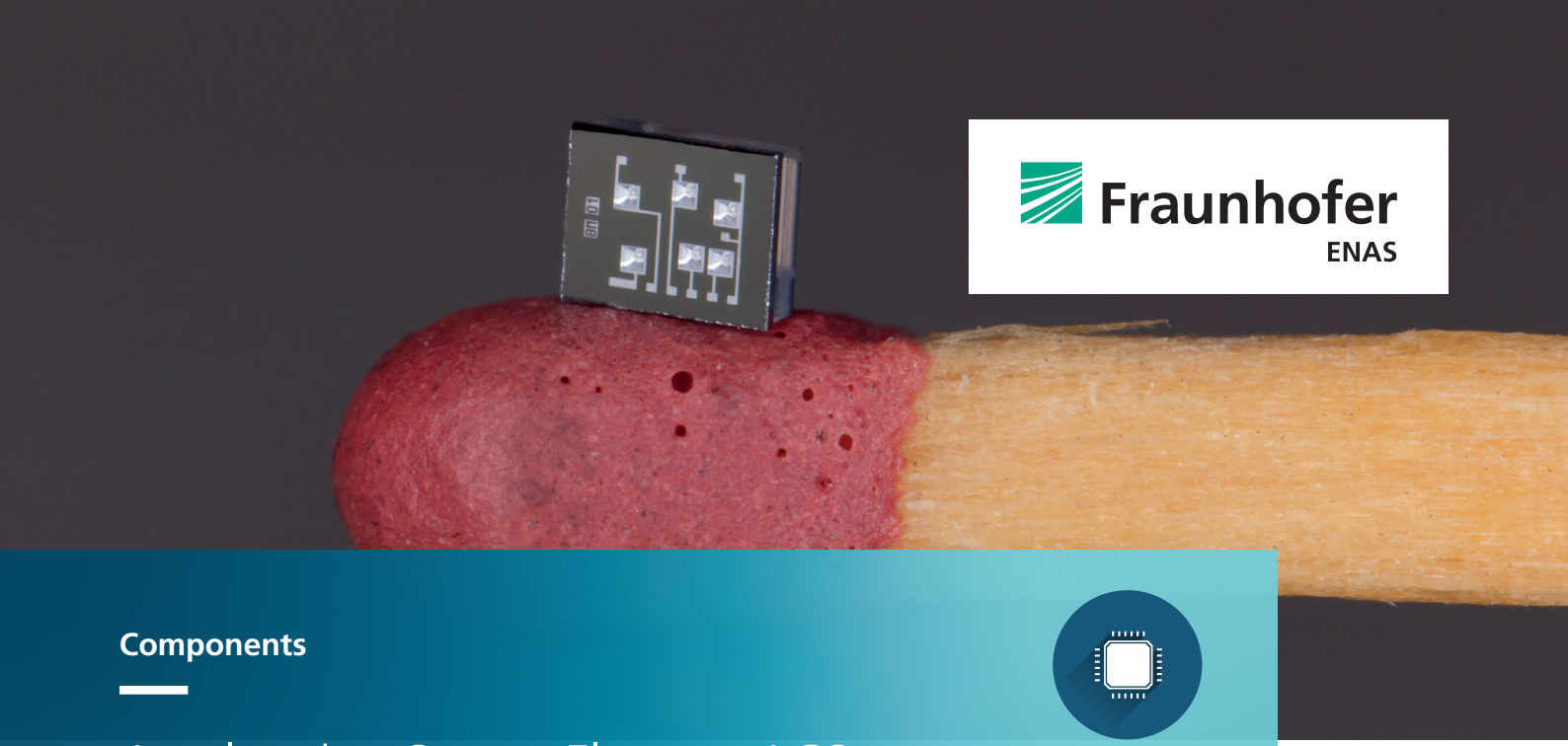


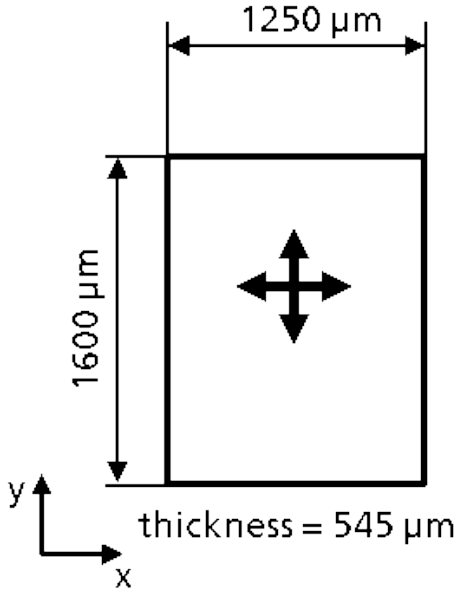
Fraunhofer ENAS

Components

Acceleration Sensor Element ACS

Fast Facts

- Different Eigenfrequencies for different bandwidths
- Small 2-axes or single axis sensor element
- Different sensitivities
- Capacitive principle



Chip dimensions.

General Description

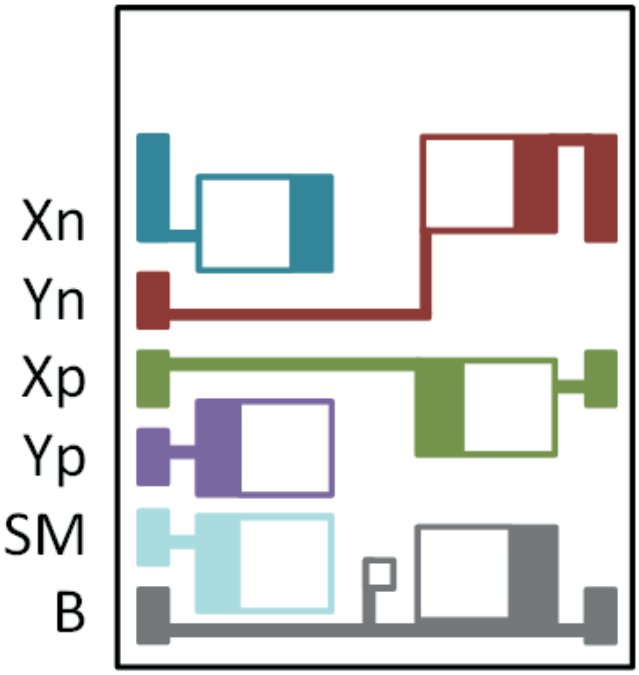
The ACS series micromechanical sensor element is designed for the measurement of linear accelerations in one and two directions. The MEMS sensor element consists of one mechanical seismic mass structure for detection of acceleration in x- and y-directions. The working principle is based on a capacitance change. The MEMS itself is a full Silicon stack with a height of 655 µm.

Parameters

- Highly doped silicon (0.01 ... 0.05 Ωcm)
- Sensitive to linear accelerations in x and y directions
- Eigenfrequency 2 kHz, 4 kHz, 8 kHz
- Damping ratio < 1
- Base capacitance per electrode ≈ 2.8 pF for two axes and ≈ 5.6 pF for single axis elements
- Capacitive sensitivity per electrode depending on Eigenfrequency and base capacitance (see table on second page)
- Open-loop input range (see table on second page)

Suggested Applications

- Smart systems
- Condition monitoring
- Medicine (implants, smart patches, motion tracking)



Connection scheme:

Xn Electrode in negative x-direction
Yn Electrode in positive y-direction
Xp Electrode in positive x-direction
Yp Electrode in negative y-direction
SM Connection for seismic mass
B Bulk connection

Name	ACS08k	ACS04k	ACS02k	ACS08k	Unit
f0x (FEM)	8.10	3.78	2.25	---	kHz
f0y (FEM)	8.09	3.75	2.20	8.14	kHz
C0	2.79	2.79	2.79	5.58	pF
Cx	1.30	1.30	1.30	2.60	fF/µm
Cg	5	18	64	10	fF/g
max g	80	21	6	80	g

In cooperation with

ZfM Zentrum für Mikrotechnologien
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Fraunhofer ENAS is part of
Forschungsfabrik Mikroelektronik Deutschland

Contact

Dr. Roman Forke
Phone +49 371 45001-254
roman.forke@enas.fraunhofer.de

Prof. Dr. Karla Hiller
Phone +49 371 45001-400
karla.hiller@enas.fraunhofer.de

Fraunhofer ENAS
Technologie-Campus 3
09126 Chemnitz | Germany

www.enas.fraunhofer.de

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All information contained in this fact sheet is preliminary and subject to change. Furthermore, the described component is not a commercial product.