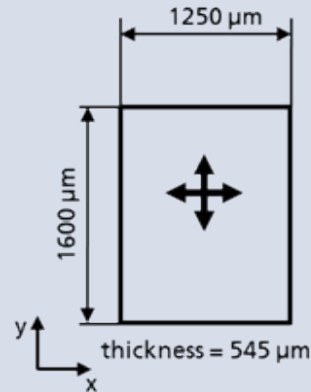
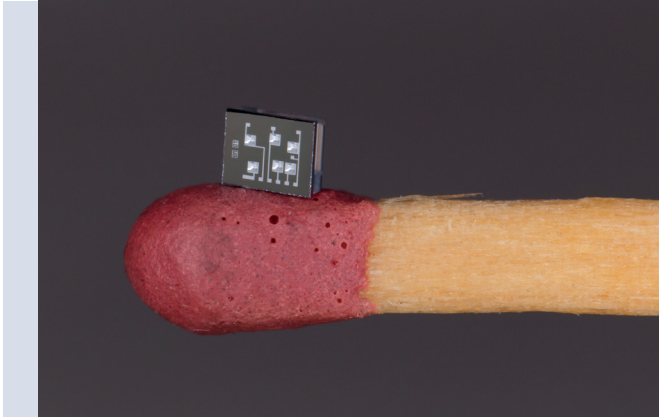


# ACCELERATION SENSOR ELEMENT ACS



Chip dimensions

## Contact

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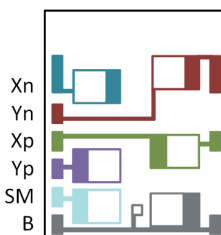
*Photo acknowledgments: Fraunhofer ENAS  
All information contained in this datasheet  
is preliminary and subject to change. Fur-  
thermore, the described systems, materials  
and processes are not commercial products.*

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  $\mu\text{m}$ .

## Parameters

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

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/ $\mu\text{m}$
Cg	5	18	64	10	fF/g
max g	80	21	6	80	g



### 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