


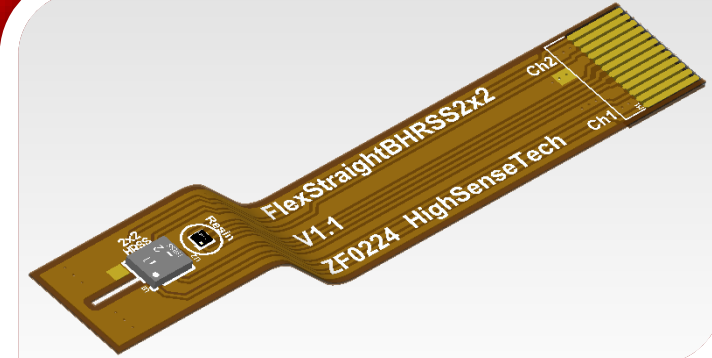


Parameters	HRSS MEMS strain sensor
Sensor Thickness	350 μm
Connection to electronics	Flex PCB - FPC 12pins connector
Measuring principle	MEMS vibrating wire
Operation principle	Low noise closed loop readout
Applicable bonding materials	Cold/hot curing epoxy adhesive
Active gauge length	0.30 mm (0,012")
Range (nominal)	1000 με
Resonance frequency	300 - 400 kHz
Resolution	0.004 με @ 100Hz 0.00035 με @ 10Hz
Accuracy	±0.5% FS
Measuiring bandwidth ($0.5/T_{acq}$)	5 kHz
Embedded temperature sensor resolution	± 0.01°C
Embedded temperature sensor accuracy	± 0.3°C
Power supply	5 ÷ 17 V
Output	Digital floats (Strain and Temperature)
Comunication protocol	USB, CAN FD, HS-CAN, customizable
Sensor thermal expansion coefficient	$3 \times 10^{-6} / ^\circ C$
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HRSS

High Resolution Strain Sensor



Sensing Beyond the limits

*Simplify real-time measurement
of your products and create new
business opportunities...*

*Innovative MEMS microsensors
for High-Resolution, Non-
Invasive Diagnostics and
Prognostics*



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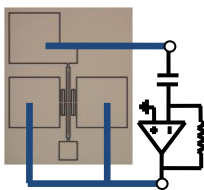
High-resolution, low power strain sensors based on MEMS resonators

MEMS sensor (HRSS) obtained by top/down micromachining of monocrystalline silicon

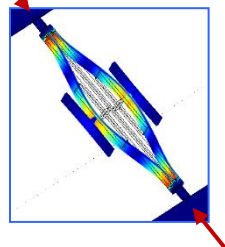
A resonant micromechanical device serves as a high-resolution strain sensor, exploiting the correlation between its mechanical resonance frequency and the applied force along its axis.

Under such conditions, this frequency undergoes significant variations, analogous to a guitar string changing its tone when tuned. The oscillation frequency of a closed-loop circuit containing the resonator is utilized as sensing signal for strain.

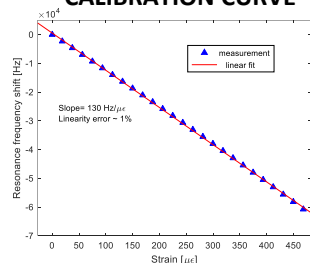
OSCILLATOR SIMPLIFIED CIRCUIT



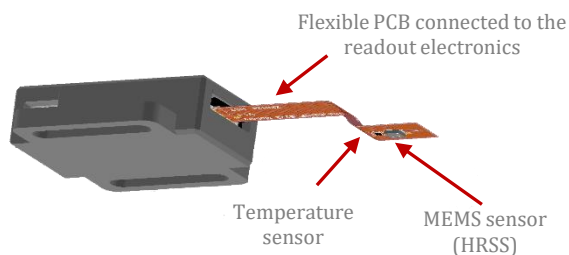
AXIAL LOAD



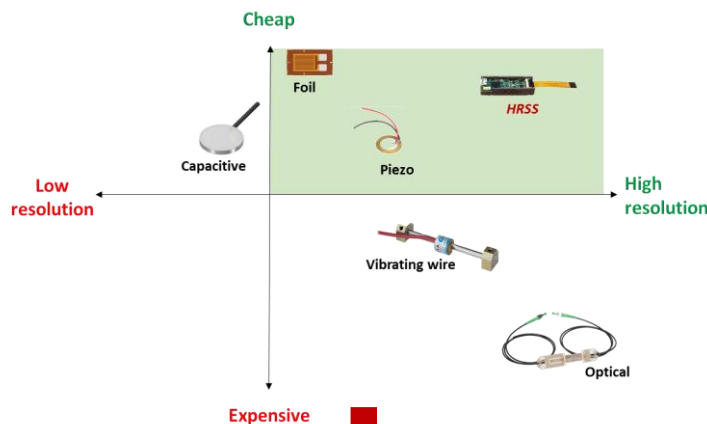
RESONANT SENSOR CALIBRATION CURVE



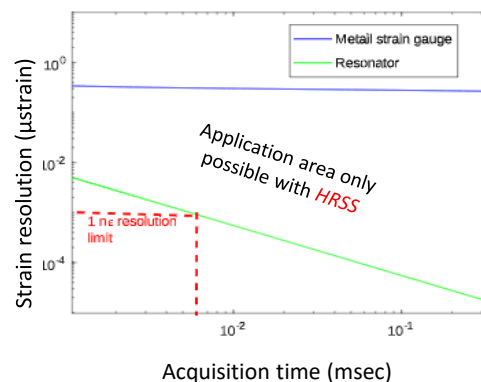
STRAIN SENSOR PACKAGE



COMPARISON WITH COMMERCIAL STRAIN GAUGE



APPLICATION AREAS

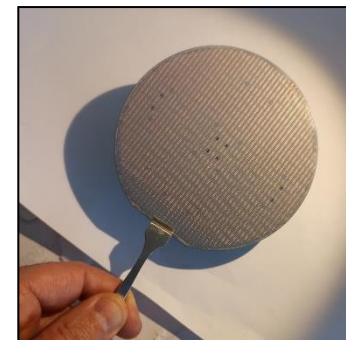


HRSS sensor can measure:

- Strain
- Pressure
- Force
- Weight
- Torque
- and more...

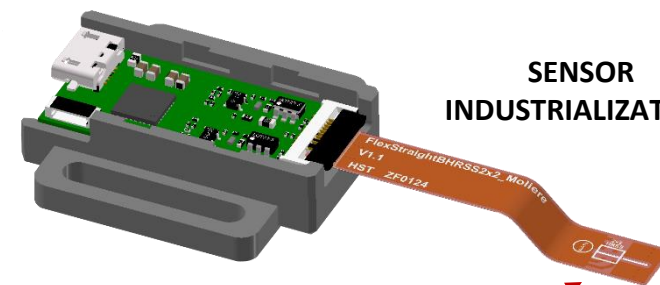
Our microsensors offer unparalleled precision and bandwidth, enabling real-time fast measurement

PRODUCTION CAPABILITY

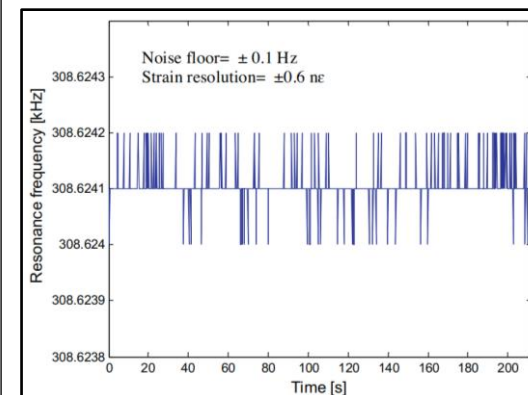


The fabrication process is implemented on 4-inch Silicon on Insulator (SOI) technology. A sensor chip size of 2x2.5 mm² ensures a yield for wafers exceeding 1000. Present HST production capabilities reach 20,000 sensors per year, with plans to scale up to 200,000 within the next three years.

SENSOR INDUSTRIALIZATION



OSCILLATOR OUTPUT HIGH STABILITY IN FREQUENCY



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