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ZETOM-CERT

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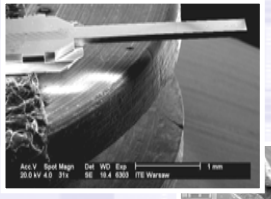
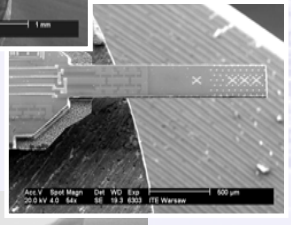
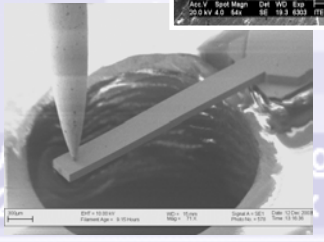
The family of force/tactile sensors for micro- and nanomanipulation

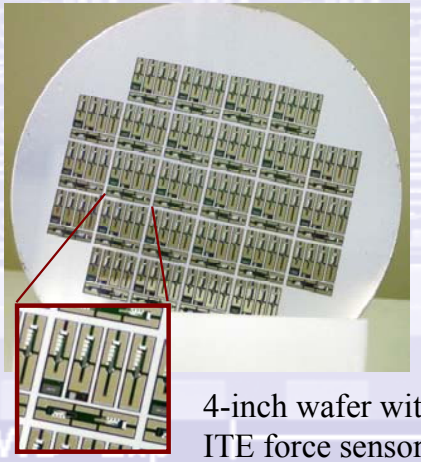




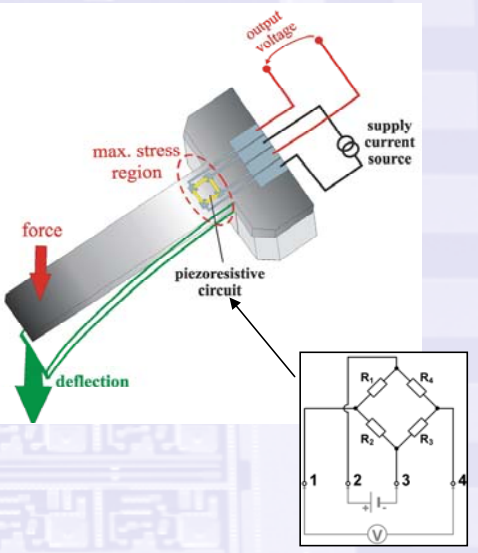


ITE piezoresistive force sensor

Force sensors developed at ITE are based on a piezoresistive silicon cantilever. Our sensors are compact, flexible and require only simple electronic setup (DC voltage measurement). Family of the sensors includes few configurations (shape and thickness of the cantilever) to adjust sensor to the size, shape and hardness of the gripped object.



4-inch wafer with ITE force sensors

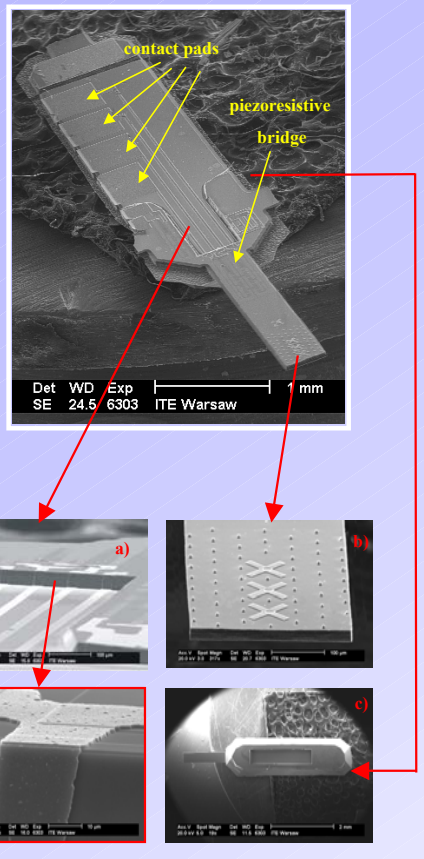


The piezoresistive circuit of ITE sensor contains:

- *a set of piezoresistors in the Wheatstone bridge setup*
- *additional compensation of temperature and offset voltage.*

The end of the cantilever beam may be used as an end-effector of the gripping device.

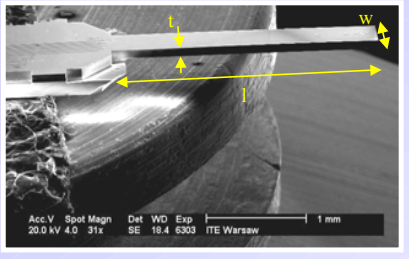
Sensor features



a) Depression for contact pads for protecting the bonding area. b)Tips on the end of the cantilever to make it rough and to improve gripping of an object c) Deep cavity for repeatable positioning and gluing sensor to the gripper.

Parameters of ITE force/tactile sensors

To cover a wide area of gripping forces we produce sensors with different cantilever parameters.



Dimensions:

Length (*l*) - 1000µm,1500µm, 2500µm and 3000µm

Thickness (*t*) - 20µm up to 100µm

Width (*w*) - 350µm

Electro-mechanical parameters:

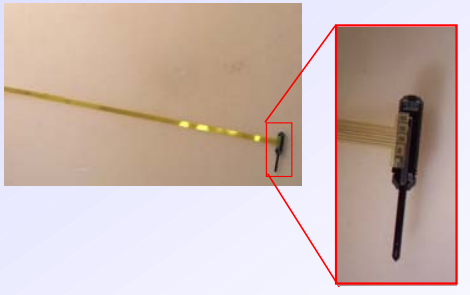
Spring constants - the range from 5Nm^{-1} up to 600Nm^{-1}

Measured forces (*depending on sensor type*) – ranges from 1.0 mN ± 10 nN up to 100.0 ± 0.1 mN

Measured deflections (*depending on sensor type*) – ranges from 1.00 ± 0.01 µm up to 90.0 ± 0.1 µm

Every ITE force sensor has a detailed specification with all crucial parameters needed to use force sensors.

Few different types of bases for our sensors are proposed.



Sensor with elastic lead for easy connections

ITE force/tactile sensors meet all requirements for micro- and nanomanipulation of small objects.

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