

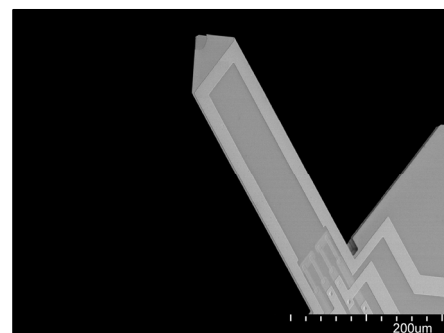
# PRSA-L400-F30-TL-PCB/CHP

Silicon piezo-resistive sensing cantilevers

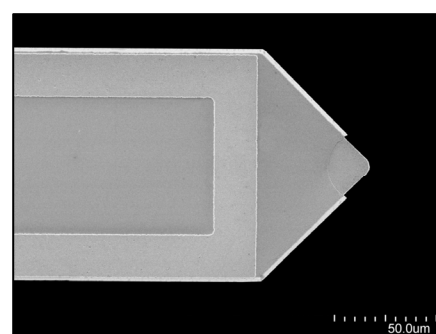


## General description

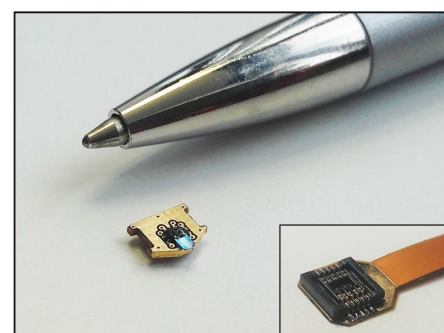
Piezo-Resistive Sensing Active (PRSA) probes are silicon cantilevers with integrated piezo-resistors on-chip and a heater for self-sensing and self-actuating probe applications. The piezo-resistors are integrated into a matched Wheatstone bridge to raise the sensitivity and compensate environmental thermal drift. By using the self-sensing readout no laser adjustment is necessary in comparison to conventional optical readout AFM systems. This saves time during a cantilever change. The free space above the cantilever enables new applications. The cantilever chip is bonded to a small printed circuit board (PCB) with a small connector for a quick cantilever change. A non-bonded chip is also available (-CHP version). The cantilever PCB can be connected to a low-noise pre-amplifier by using our flexible counter-part PCB.



Top side of a PRSA-L400 cantilever with Al tracks for reading out the sensor signal



Top view of a PRSA-L400 cantilever with heater /current loop structure



Cantilever is bonded to a 6 x 4.5 mm PCB (height with connector 1.6 mm, with CP-PCB: 2.5 mm); right: Flex-CP-PCB

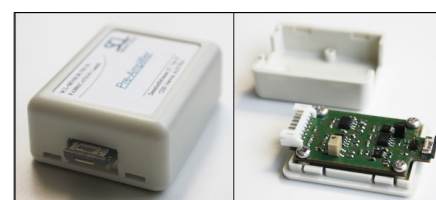
## Specifications

Model*	PRSA-L400-F30-TL-PCB PRSA-L400-F30-TL-CHP
Resonant frequency	15...40 kHz
Spring constant (calc.)	0.4...8.3 N/m
sensitivity**	1 $\mu$ V/nm
force sensitivity**	0.4...8.3 nN/ $\mu$ V
Length, width	410 $\pm$ 5 $\mu$ m, 115 $\pm$ 3 $\mu$ m
Material	silicon cantilever, boron doped 1k Ohm piezo resistors, aluminium tracks
Deflection sensing	on chip piezo-resistive bridge
Actuator	external shaker or on-chip heater (10 +/-2 Ohm)
Electrical connections	bonded to small PCB with connector (counter part PCB available) or delivered as bare chip (bonding pads on-chip)
Chip dimensions (h, w, l)	0.3 / 1.2 / 2.5 mm
* Electrical characterization is only possible for bonded cantilevers.	
** measured without amplification, 2.048 V bridge supply	

## Applications:

- Integration in various setups for gas property, torque magnetometry or force measurements.
- Force or deflection measurements within TEM, SEM, XPS, etc.

**What about your application? Contact us!**



Hardware for amplified readout:  
Low-noise pre-amplifier (45x35 mm)

## SCL-Sensor.Tech. Fabrication GmbH

Seestadtstrasse 27, Top 27

1220 Vienna, AUSTRIA

web: [www.sclsensortech.com](http://www.sclsensortech.com)

Contact: Alexander Deutschinger

Phone: +43-1-8904345-14

[a.deutschinger@scsensorsortech.com](mailto:a.deutschinger@scsensorsortech.com)

Leaflet version: 2018-10-23