

PRS-L450-F30-TL-PCB/CHP

Silicon piezo-resistive sensing cantilevers



General description

Piezo-Resistive Sensing (PRS) tipless probes are silicon cantilevers with on chip integrated piezo-resistors for various self-sensing cantilever 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. This saves time during a cantilever change and makes it independent from laser readout optics. This enables new sensing applications (e.g. force and gas sensing, torque magnetometry, special tip mounting). The cantilever Si-chip is mounted to a small printed circuit board (CL-PCB) with a small 10 pin connector for a quick and easy cantilever change. The connector fits to a counter part PCB, for customized wiring or it can be directly connected to a SCL's low-noise pre-amplifier by a flat flex cable. Optional the cantilevers can be ordered as Si-chips.

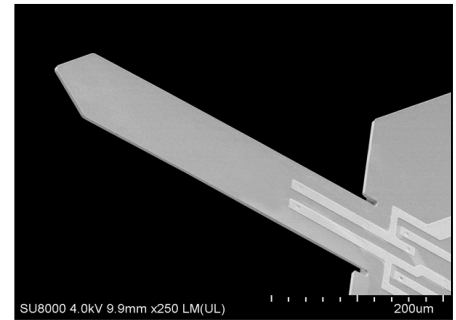
Specifications

Model	PRS-L450-F30-TL-PCB PRS-L450-F30-TL-CHP
Resonant frequency	17...40 kHz
Spring constant	0.7...9.3 N/m
sensitivity*	1...2 $\mu\text{V}/\text{nm}$
force sensitivity*	0.3...9.3 nN/ μV
Length, width	450 \pm 5 μm , 100 \pm 3 μm
Material	silicon cantilever, boron doped 1k Ohm piezo resistors, aluminium tracks
Deflection sensing	on chip piezo-resistive bridge
Actuator	external shaker
Electrical connections	bonded to small PCB with connector (counter part PCB available) or optional bonding pads on chip
Chip dimensions (h, w, l)	0.3 / 1 / 2.6 mm
* not amplified, 2.048 V bridge supply	

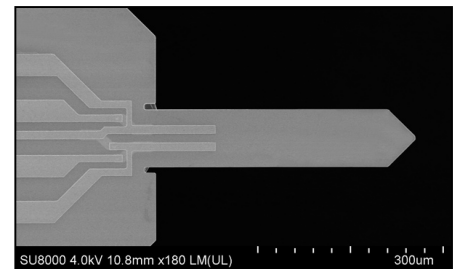
Applications:

- Force or deflection measurements within TEM, SEM, XPS, etc.
- Torque magnetometry
- Mounting of special tips
- Various cantilever based sensor applications (media properties, air pressure/acoustic wave, etc.)

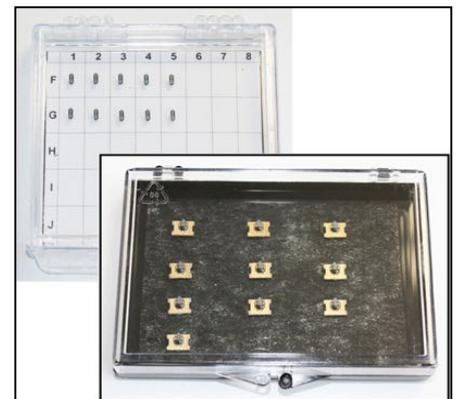
What about your application? Contact us!



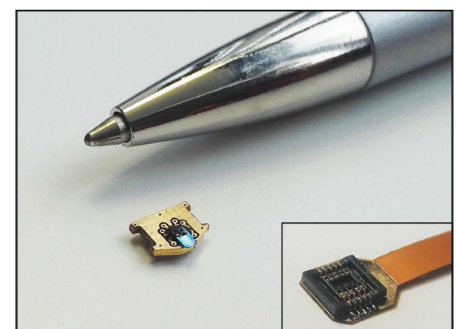
Tipless probe with Al sensor signal tracks



Top view of the probe



10 self-sensing cantilevers (on PCB or optional as Si-chips), Si-chip h=0.3 mm



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

SCL-Sensor.Tech. Fabrication GmbH

Viktor-Kaplan Straße 2, Bauteil E

2700 Wiener Neustadt, AUSTRIA

web: www.sclsensortech.com

Contact: Fabian Edlinger
Phone: +43 660 4424 871
fabian.edlinger@c-sense.at
Leaflet version: 2024-03-11

PRS-L100-F500-TL-PCB/CHP

Silicon piezo-resistive sensing cantilevers



General description

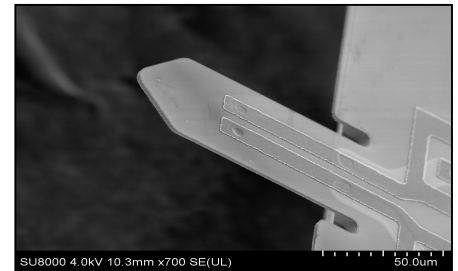
Piezo-Resistive Sensing (PRS) tipless probes are silicon cantilevers with on chip integrated piezo-resistors for various self-sensing cantilever applications. The piezo-resistors are integrated into a matched Wheatstone bridge to raise the sensitivity and compensate environmental thermal drift. By using the self-sensing readout no laser adjustment is necessary in comparison to conventional optical readout. This saves time during a cantilever change and makes it independent from laser readout optics. This enables new sensing applications (e.g. force and gas sensing, torque magnetometry, special tip mounting). The cantilever Si-chip is mounted to a small printed circuit board (CL-PCB) with a small 10 pin connector for a quick and easy cantilever change. The connector fits to a counter part PCB, for customized wiring or it can be directly connected to a SCL's low-noise pre-amplifier by a flat flex cable. Optional the cantilevers can be ordered as non-bonded Si-chips.

Specifications	
Model	PRS-L100-F500-TL-PCB PRS-L100-F500-TL-CHP
Resonant frequency	200...800 kHz
Spring constant	6...400 N/m
sensitivity*	1...3 $\mu\text{V}/\text{nm}$
force sensitivity*	2...400 nN/ μV
Length, width	100 μm (+/-5), 48 ± 3 μm
Material	silicon cantilever, boron doped 1k Ohm piezo resistors, aluminium tracks
Deflection sensing	on chip piezo-resistive bridge
Actuator	external shaker
Electrical connections	bonded to small PCB with connector (counter part PCB available) or optional bonding pads on chip
Chip dimensions (h, w, l)	0.3 / 1 / 2.7 mm
* not amplified, 2.048 V bridge supply	

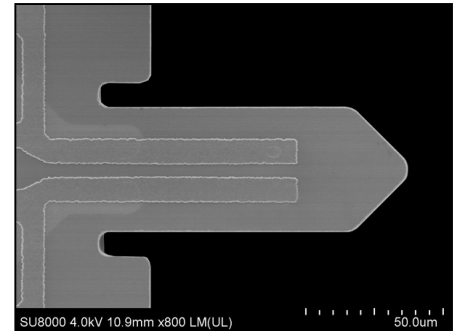
Applications:

- Force or deflection measurements within TEM, SEM, XPS, etc.
- Torque magnetometry
- Mounting of special tips
- Various cantilever-based sensor applications (media properties, air pressure/acoustic wave, etc.)

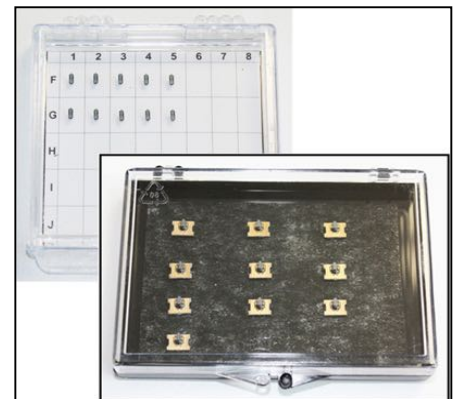
What about your application? Contact us!



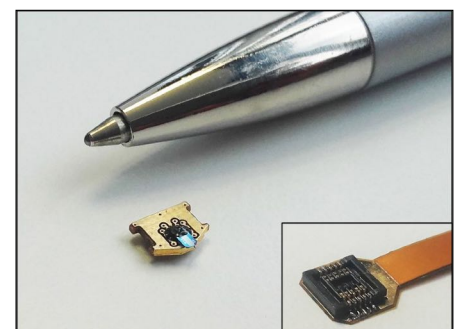
Tipless probe with Al sensor signal tracks



Top view of the probe



10 self-sensing cantilevers (on PCB or optional as Si-chips), Si-chip h=0.3 mm



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

SCL-Sensor.Tech. Fabrication GmbH

Viktor-Kaplan Straße 2, Bauteil E
2700 Wiener Neustadt, AUSTRIA
web: www.sclsensortech.com

Contact: Fabian Edlinger
Phone: +43 660 4424 871
fabian.edlinger@c-sense.at
Leaflet version: 2024-03-11

PRSA-L300-F50/60/80-TL-PCB/CHP

Silicon piezo-resistive sensing cantilevers



General description

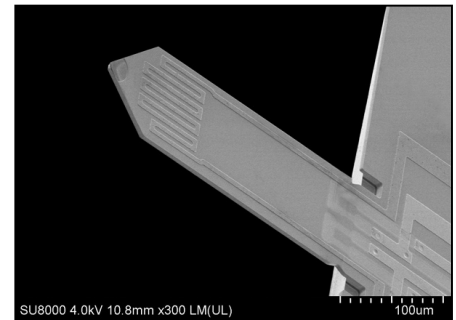
Piezo-Resistive Sensing Active (PRSA) tipless probes are silicon cantilevers with on chip integrated piezo-resistors and a heater for various self-sensing cantilever applications. The piezo-resistors are integrated into a matched Wheatstone bridge to raise the sensitivity and compensate environmental thermal drift. By using the self-sensing readout no laser adjustment is necessary in comparison to conventional optical readout. This saves time during a cantilever change and makes it independent from laser readout optics. This enables new sensing applications (e.g. force and gas sensing, torque magnetometry, etc.). The cantilever Si-chip is mounted to a small printed circuit board (CL-PCB) with a small 10 pin connector for a quick and easy cantilever change. The connector fits to a counter part PCB, for customized wiring or it can be directly connected to a SCL's low-noise pre-amplifier by a flat flex cable. Optional the cantilevers can be ordered as Si-chips.

Specifications		
Model **	PRSA-L300-F60-TL-CHP	
	PRSA-L300-F50-TL-PCB	PRSA-L300-F80-TL-PCB
Resonant frequency **	30...65 kHz	65...95 kHz
Spring constant **	1...15 N/m	15...56 N/m
sensitivity*	1...2 μV/nm	
force sensitivity*	0.5...56 nN/μV	
Length / Width	300 ±5 μm / 110 ±3 μm	
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	
Electrical connections	bonded to small PCB with connector (counter part PCB available) or optional bonding pads on chip	
Chip dimensions (h, w, l)	0.3 / 1.2 / 2.5 mm	
* not amplified (signal direct at the chip), 2.048 V bridge supply		
** Cantilever models are divided in two parameter ranges when electrical characterization is possible with bonded cantilevers		

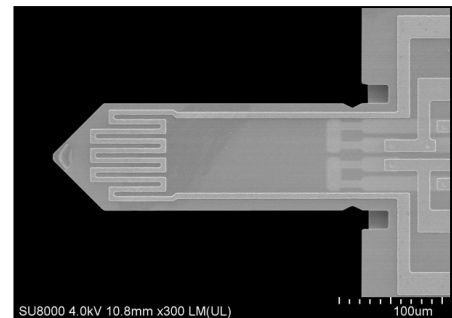
Applications:

- Force or deflection measurements within TEM, SEM, XPS, etc.
- Torque magnetometry
- Mounting of special tips
- Various cantilever based sensor applications (media properties, air pressure/acoustic wave, etc.)

What about your application? Contact us!



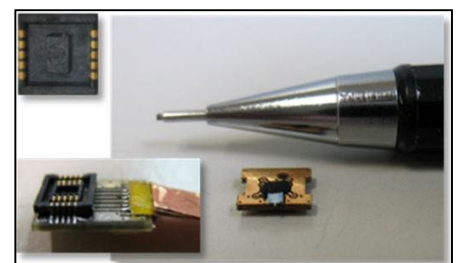
Tipless probe with Al sensor signal tracks



Top view of the probe



10 self-sensing cantilevers (on PCB or optional as Si-chips), Si-chip h=0.3 mm



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

SCL-Sensor.Tech. Fabrication GmbH

Viktor-Kaplan Straße 2, Bauteil E

2700 Wiener Neustadt, AUSTRIA

web: www.sclsensortech.com

Contact: Fabian Edlinger
Phone: +43 660 4424 871
fabian.edlinger@c-sense.at
Leaflet version: 2024-03-11

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 SCL's low-noise pre-amplifier via a SCL's flex PCB with its counter-part PCB.

Specifications	
Model*	PRSA-L400-F30-TL-PCB PRSA-L400-F30-TL-CHP
Resonant frequency	14...45 kHz
Spring constant (calc.)	0.3...12 N/m
sensitivity**	1 $\mu\text{V}/\text{nm}$
force sensitivity**	0.3...12 nN/ μV
Length, width	410 \pm 5 μm , 115 \pm 3 μm
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 (12 +/-4 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.

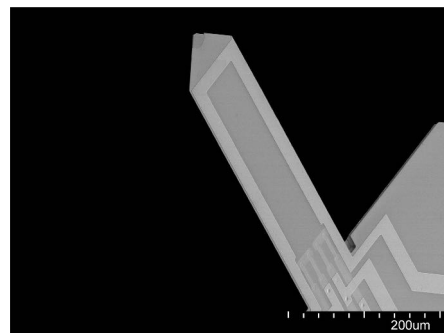
What about your application? Contact us!

SCL-Sensor.Tech. Fabrication GmbH

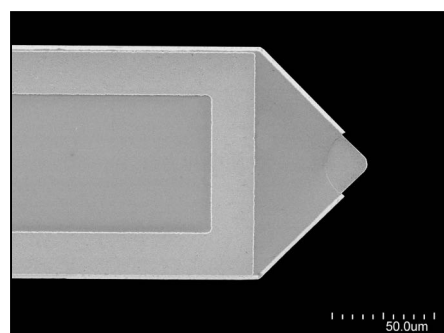
Viktor-Kaplan Straße 2, Bauteil E

2700 Wiener Neustadt, AUSTRIA

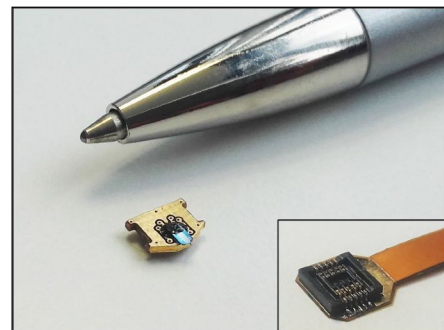
web: www.sclsensortech.com



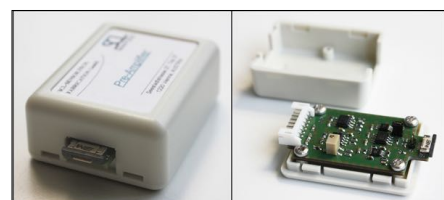
Top side of a PRSA-L400 cantilever with Al tracks for reading out the sensor signal



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, complete height connected to CP-PCB: 1.8 mm); left: counter part PCB



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

Contact: Fabian Edlinger
Phone: +43 660 4424 871
fabian.edlinger@c-sense.at
Leaflet version: 2024-03-11