

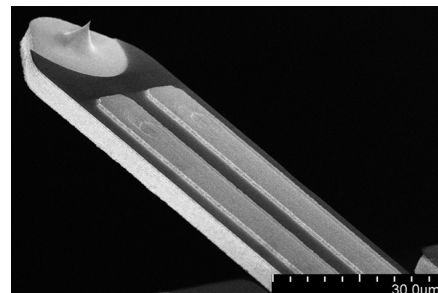
PRS-L70-F900-Si-PCB/CHP

Silicon piezo-resistive sensing cantilevers

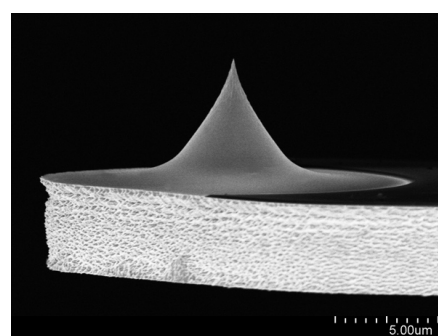


General description

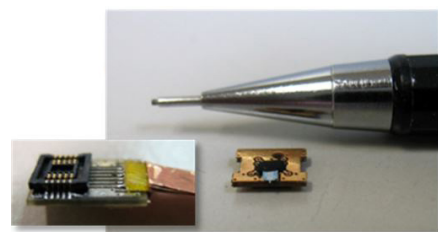
Piezo-Resistive Sensing (PRS) probes are silicon cantilevers with an integrated piezo-resistor for self-sensing scanning probe microscopy applications. The piezo-resistors are integrated into a matched Wheatstone bridge to optimize the sensitivity and compensate environmental thermal drift. By using the self-sensing readout no laser adjustment is necessary in comparison to conventional optical readout AFM systems. This saves time during a cantilever change. Furthermore the new free space above the cantilever enables new applications and combination of AFM with various instruments. The cantilever chip is bonded onto a small printed circuit board (PCB) with a small connector for a quick cantilever change. The counter part PCB for the cantilever PCB can be connected to a low-noise pre-amplifier with a flat flex cable.



Tip side of a PRS-L70 cantilever with Al tracks for reading out the sensor signal



Side view of a PRS-L70-F900 cantilever



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

Specifications

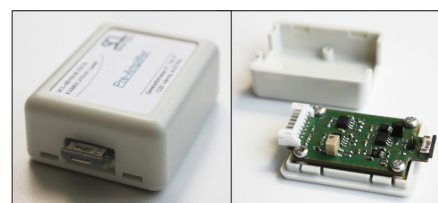
Parameter	PRS-L70-F900-Si-PCB PRS-L70-F900-Si-CHP
Tip radius (apex)	<15 nm
Tip height	4...7 µm
Tip material	silicon
Resonant frequency	500...1300 kHz
Spring constant	35...400 N/m
AFM mode	tapping
sensitivity*	3 µV/nm
Length, width	70...85 µm, 30 ±1 µm
Material	silicon cantilever, boron doped 1k Ohm piezo 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 / 2.8 mm

* not amplified, 2.048 V bridge supply

Applications:

- Integration on a standard AFM scanner
- Force or deflection measurements within TEM, SEM, XPS, etc.
- Torque magnetometry
- Tip scanning high-speed AFM
- Various cantilever based sensor applications (media properties, air pressure/acoustic wave, etc.)

What about your application? Contact us!



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

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