

# PRS-L300-F50/60/80-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, etc.). By standard 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

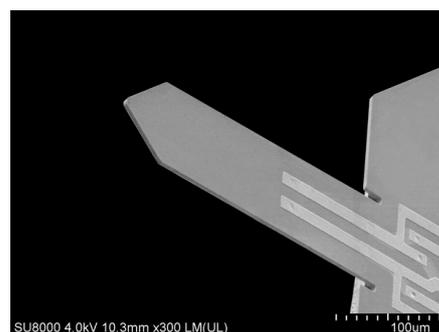
Model**	PRS-L300-F60-TL-CHP	
	PRS-L300-F50-TL-PCB	PRS-L300-F80-TL-PCB
Resonant frequency**	30...65 kHz	65...95 kHz
Spring constant**	1...15 N/m	15...56 N/m
Application	torque magnetometry, force sensing, gas properties, mounting of special tips	
sensitivity*	1...2 $\mu\text{V}/\text{nm}$	
force sensitivity*	0.5...56 $\text{nN}/\mu\text{V}$	
Length / Width	300 $\pm$ 5 $\mu\text{m}$ / 110 $\pm$ 3 $\mu\text{m}$	
Material	silicon cantilever, boron doped 1k Ohm piezo resistors, aluminium tracks	
Deflection sensing	on chip piezo-resistive bridge	
Actuator	external shaker	
Electrical connections	mounted to a small PCB with 10 pin connector (counter part PCB available) or optional as Si chip	
Chip dimensions (h, w, l)	0.3 / 1 / 2.6 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

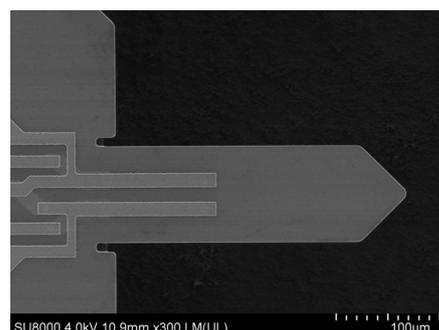
## Applications:

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

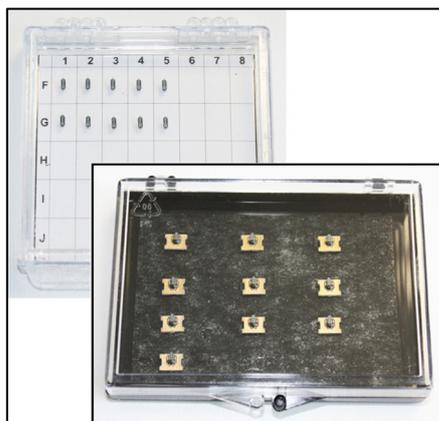
**What about your application? Contact us!**



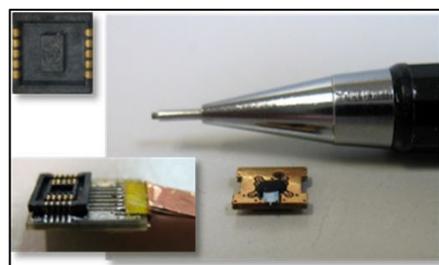
Tipless probe with Al sensor signal tracks



Top view of the probe



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



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

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