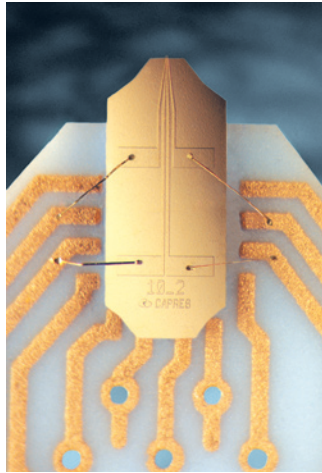
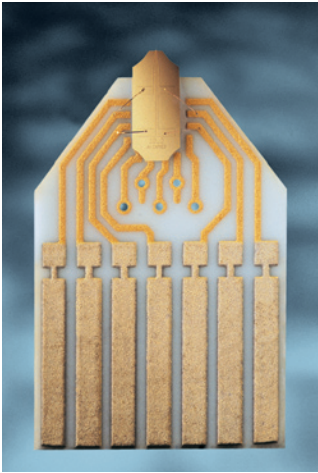


# The Microscopic Four Point Probe

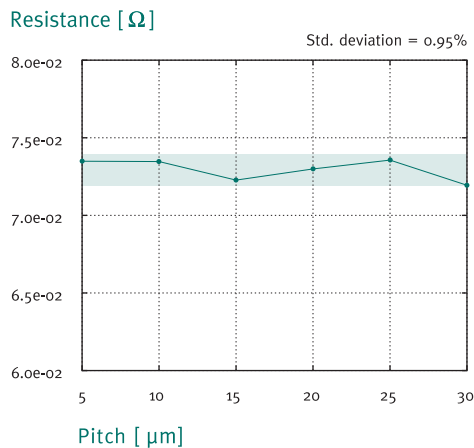


CAPRES' technology platform provides accurate microscale electrical characterisation using microscopic multipoint probes. The probes are ideal for quality control in the semiconductor and thin-film industry, as well as for R&D purposes.

The Microscopic Four Point Probe (M4PP) consists of a probe chip with four parallel individually isolated cantilevers covered with a conductive layer. The flexible cantilevers extend from a Si base. The M4PPs are mounted on a ceramic substrate with 14 Au covered Ag/Pd connector strips. Au bonding wires establish electrical contact between the cantilevers and the connector strips.

The M4PPs are fabricated using silicon based micro fabrication technology. The M4PPs are formed in a thermal SiO<sub>2</sub> layer grown on a Si wafer. The Si base is partly removed by a KOH wet etch thereby releasing the cantilevers. A conductive Ti/Au layer is deposited on top of the M4PPs. The Ti layer is about 25 nm thick and serves as an adhesive layer. Finally a 100 nm thick Au layer is deposited as top electrode layer. For further fabrication details see [C. L. Petersen et al. 2002 in Sensors and Actuators A96 53-58].

## Standard Microscopic Four Point Probe Data:



## Cantilever data:

Pitch	Width	Length
5 $\mu\text{m}$	3 $\mu\text{m}$	25 $\mu\text{m}$
10 $\mu\text{m}$	6 $\mu\text{m}$	30 $\mu\text{m}$
15 $\mu\text{m}$	6 $\mu\text{m}$	30 $\mu\text{m}$
20 $\mu\text{m}$	6 $\mu\text{m}$	30 $\mu\text{m}$
25 $\mu\text{m}$	6 $\mu\text{m}$	30 $\mu\text{m}$
30 $\mu\text{m}$	6 $\mu\text{m}$	30 $\mu\text{m}$

Cantilever thickness: 1  $\mu\text{m}$   
Spring constant (approx.): 5 N/m

Typical cantilever contact area (diameter)  
- on metal surfaces: 10 nm to 100 nm

**Demonstration of cantilever pitch uniformity. Multiple engages on the same surface with different probes. Each data point represents the average value of data collected by a given probe with its individual value of the equidistant cantilever pitch.**

Non-standard probes and systems are available on request, including microscopic multi point probes with cantilever pitch down to 1  $\mu\text{m}$ .

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