



CENTER FOR ADVANCED METROLOGY SOLUTIONS

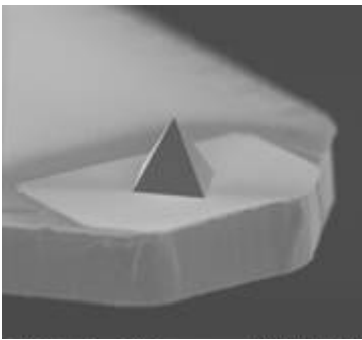
IMEC SERVICES



Solid Diamond AFM Probes

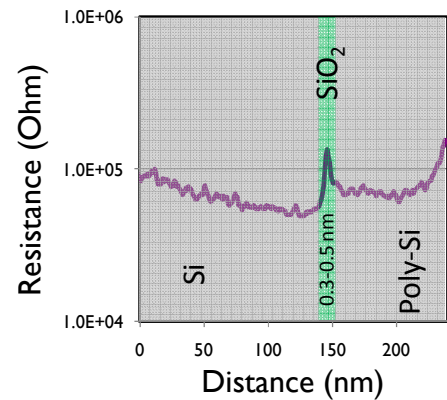
The imec CAMS diamond AFM tips are made from solid boron-doped polycrystalline diamond. These tips enable high-resolution electrical AFM measurements requiring high forces, such as Scanning Spreading Resistance Microscopy (SSRM), both for contact and non-contact mode. Each probe has three cantilevers with distinct spring constants for ultimate versatility.

Tips



SEM image of the solid diamond tip

The tips are made of B-doped polycrystalline diamond in a pyramidal shape. The measured resistance of the diamond tips on a Platinum surface is between 10 and 1000 kΩ, depending on the tip radius. The electrical resolution is typically below 1 nm, as measured on a dedicated buried oxide sample (see image on the right).



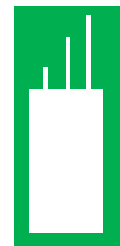
SSRM measurement on a 0.3-0.5nm buried oxide

Cantilevers

Each probe has three cantilevers with different spring constants covering a wide range of force constants, from 3 to 27 N/m. The Ni cantilevers are mounted on a metallized Si chip (3.4 x 1.6 x 0.4 mm).



SEM image of the three cantilevers



Probe layout

Technical Specifications

| Cantilever | Spring Constant | | Length | Width | Thickness |
|------------|-----------------|-------------|--------------|--------------|-----------|
| | nominal | (N/m) range | (μm) nominal | (μm) nominal | (μm) (±1) |
| Short | 27 | 14-47 | 225 | 50 | 5 |
| Medium | 11 | 5-19 | 305 | 50 | 5 |
| Long | 3 | 1-6 | 465 | 50 | 5 |

Contact us

Imec
Center for Advanced Metrology Solutions
Kapeldreef 75
BE-3001 Leuven
Belgium

Email: cams@imec.be
Phone: +32 16 28 34 38

www.imec.be/cams