IMNS Silicon-AFM-Probes

IMNS Silicon-AFM-Probes provide the well-known features of the convenient AFM probes such as high application versatility and compatibility with most commercial AFMs with a small reproducible tip radius as well as a more defined tip shape. The typical tip radius of less than 10 nm and the minimized variation in tip shape provide more reproducible images and enhanced resolution.

General info:

IMNS Silicon-AFM-probes are manufactured from highly doped, single crystal silicon without any intrinsic mechanical stress. Its low resistivity of 0.002-0.004 ohm/cm avoids electrostatic charging of the probe. The monolithic fabricated probes lead to an absolutely straight cantilever without any bending. Gold backside coating provides the high reflective chemistry stable layer that improves reflectivity 2.5 times in comparison with uncoated probes. The chemical inertness allows application in fluids or electrochemical cells. The tip is pointing into the <100> crystal direction.

Tip Features

Total tip shape is tetrahedral
Tip radius is typically 5-10 nm
Tip height is 10 - 15 µm
Tip offset: 5 - 20 µm

Cantilever Feature

Backside width is given in probes specification
Available for contact, non-contact, Semicontact mode.
Tip is set on the controlled distance 5-20 um from the free cantilever end.

Special Versions based on the IMNS Silicon-AFM-probes

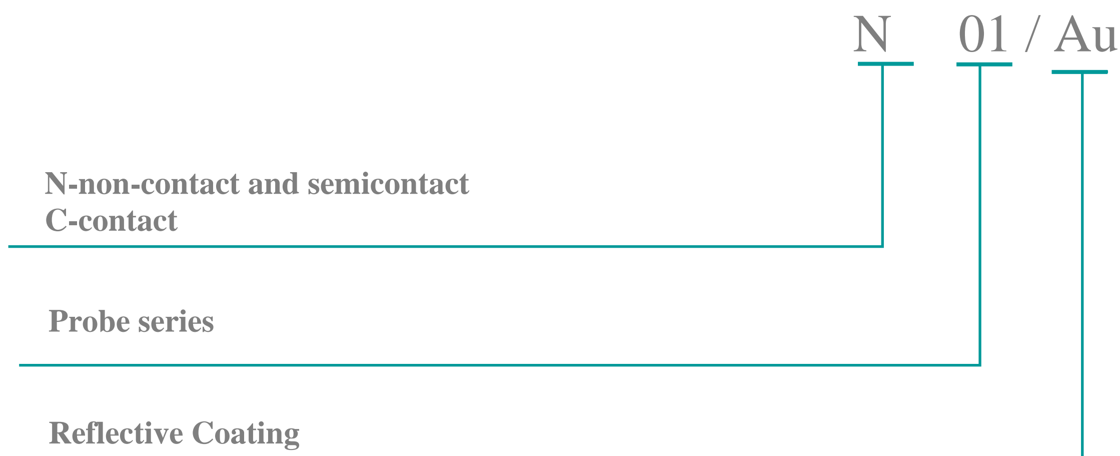
Standard AFM probes are available for SPM and AFM high resolution imaging. These probes are selected for contact, non-contact and semicontact mode.
Tipless cantilever for selected Contact, Non-Contact and Force Modulation Mode scanning probes.
Magnetic Probes are available for high resolution and minimal invasive Magnetic Force Microscopy.

Coatings

Au Coating on detector side 70 nm thick layer of gold which enhances the reflectivity of the laser beam by a factor of about 2.5.
Au Coating on both sides 70 nm thick layer of gold on both sides of the cantilever.

Magnetic Coating for the visualization of magnetic domains selected **Magnetic Probes** with different hard and soft magnetic coatings are offered (refer to Magnetic Force Microscopy flyer).

Probes series name



Semicontact/noncontact probes
N series

Substrate specification

Material	Single crystal silicon
Chip size	Chip size 3.4×1.6×0.3
Reflective side	Cr/Au
Tip coating	-

Cantilever specification

Series	Cantilever length±10µm	Cantilever width±10µm	Cantilever thickness±10µm	Resonance Frequency (KHz)			Force Constant (N/m)
				min	typical	max	typical
01	225	45	3.5	60	100	190	6
10	225	45	7	120	200	320	51
30	125	45	3.5	220	300	430	37

Contact probes
C series

Substrate specification

Material	Single crystal silicon
Chip size	Chip size 3.4×1.6×0.3
Reflective side	Cr/Au
Tip coating	-

Cantilever specification

Series	Cantilever length±10μm	Cantilever width±10μm	Cantilever thickness±10μm	Resonance Frequency (KHz)			Force Constant (N/m)
				min	typical	max	typical
01	225	45	2	35	55	75	1.2
10	450	45	3.5	17	24	45	0.8
20	450	45	2	8	14	35	0.15

Electrical probes
E series

Substrate specification

Material	Single crystal silicon
Chip size	Chip size 3.4×1.6×0.3
Reflective side	Cr/Au
Tip coating	Cr/Au

Cantilever specification

Series	Cantilever length±10μm	Cantilever width±10μm	Cantilever thickness±10μm	Resonance Frequency (KHz)			Force Constant (N/m)
				min	typical	max	typical
01	225	45	3.5	60	100	190	6
10	225	45	7	120	200	320	51
30	125	45	3.5	220	300	430	37

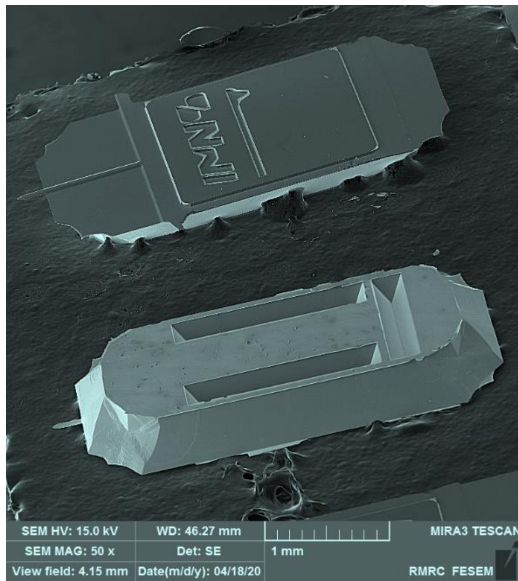
Magnetic probes
M series

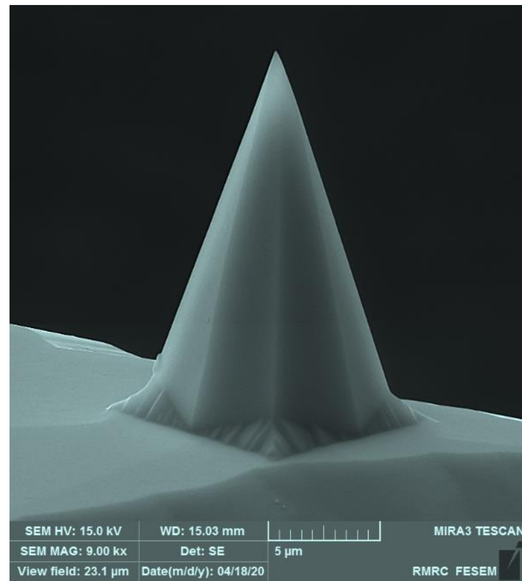
Substrate specification

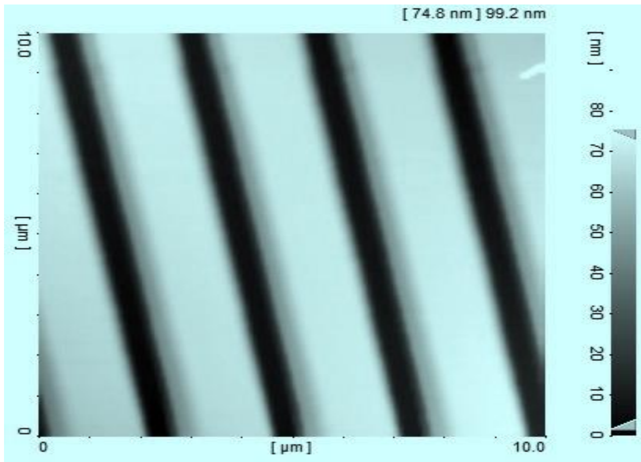
Material	Single crystal silicon
Chip size	Chip size 3.4×1.6×0.3
Reflective side	Cr/Au
Tip coating	Co/Cr

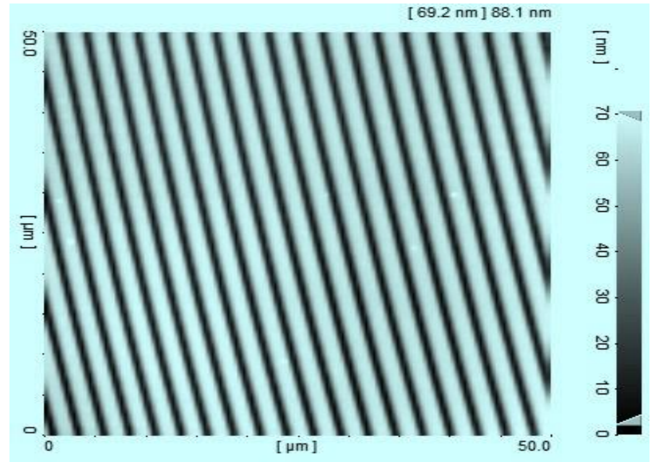
Cantilever specification

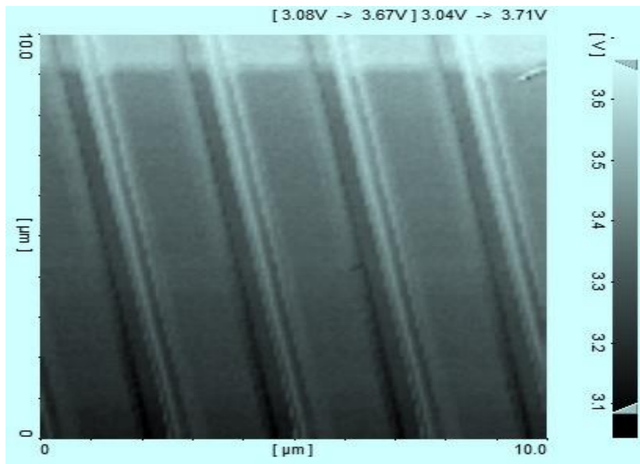
Series	Cantilever length±10µm	Cantilever width±10µm	Cantilever thickness±10µm	Resonance Frequency (KHz)			Force Constant (N/m)
				min	typical	max	typical
01	225	45	3.5	60	100	190	6
10	225	45	7	120	200	320	51
30	125	45	3.5	220	300	430	37

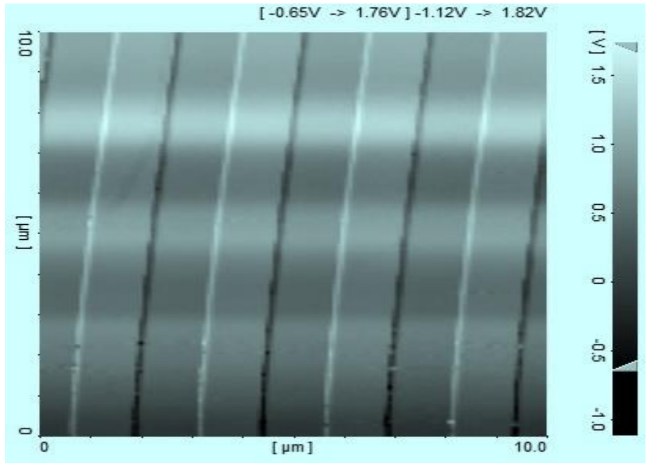





[74.8 nm] 99.2 nm
0
[μm]
10.0


[69.2 nm] 88.1 nm
0
[μm]
50.0


[3.08V -> 3.67V] 3.04V -> 3.71V
0
[μm]
10.0


[-0.65V -> 1.76V] -1.12V -> 1.82V
0
[μm]
10.0