

Zyvex nProber™

The Complete Solution for the Semiconductor Industry

Patents Pending

Features and Benefits

The new Zyvex nProber™, part of the NanoWorks® Tools product line, is designed and optimized to electrically probe sub-100nm features on semiconductor devices with superior ease-of-use and throughput.

The system consists of a state-of-the-art Zyvex Nanomanipulator, A high resolution and low kV SEM, an industry standard parametric analyzer, an advanced anti-contamination system, and custom software to control and integrate each component.

The nProber dramatically increases throughput without sacrificing ease-of-use. The system guides the user through each application while remaining flexible enough for advanced probing experiments.

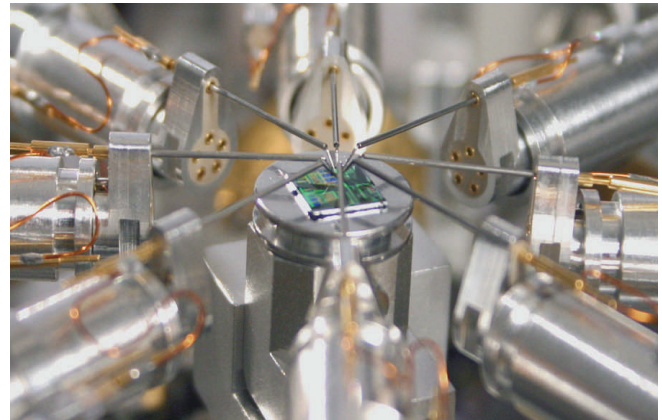
The semi-automated system has eight encoded positioners for increased probing capability and throughput. The XYZ encoded center stage provides step and repeat capability allowing the probes to remain in place while the sample is moved to the next bit. The nProber also provides vision feedback capability for point-and-click positioning of the probes and center stage. All of this can be combined with a CAD Navigation software suite to quickly locate and move to the area of interest.

An easy-to-use Windows based software platform seamlessly integrates all of the components of the nProber. The FEG SEM provides the optimal resolution, video rates, beam shift, vacuum technology, and user control required for IC nanoprobeing. The nProber's electrical characterization system is specifically designed for low-noise measurements. Our most advanced anti-contamination system rigorously cleans the SEM enabling the user to achieve superior ohmic contact.

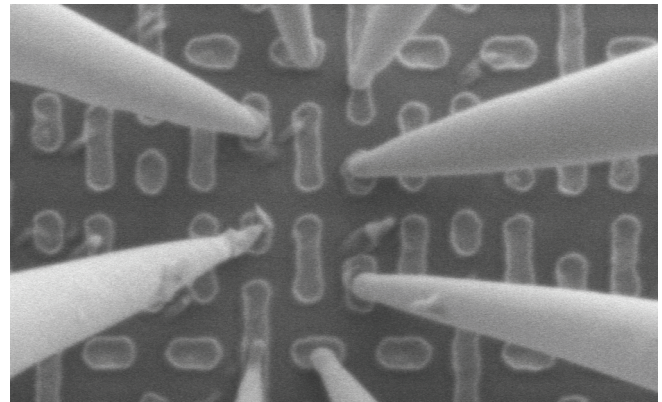
The system is also a platform for future applications packages as materials, geometries, and technologies evolve. The nProber is the complete and proven solution for IC failure analysis at the leading edge technology node.

Applications

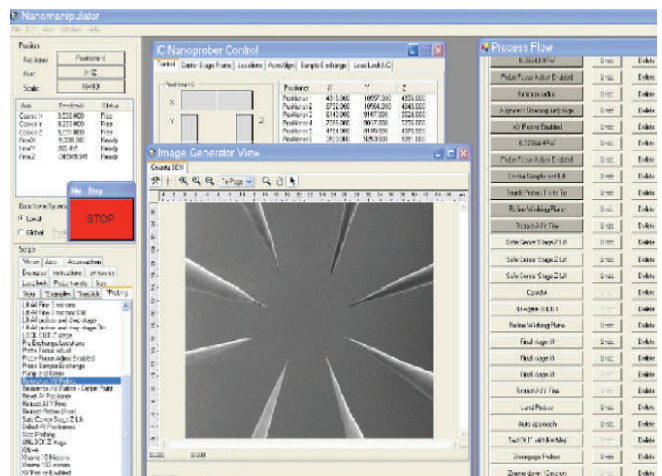
- Electrical characterization for device quality or failure analysis
 - 8-point probing
 - 6-point probing
 - 4-point probing
 - Butterfly curves
 - Kelvin probing
 - Bitcell stability testing
 - Contact-level probing
 - Metal 1-level probing
- Temperature characterization (Additional Package Needed)
- EBIC/EBAC characterization (Additional Package Needed)
- CV characterization (Additional Package Needed)
- Pulsing IV characterization (Additional Package Needed)



Eight encoded positioners enable advanced probing and increased throughput.



Eight probes characterize the stability of a 6T SRAM bitcell.



View of the Zyvex nProber software interface. Step-by-step application process flow shown on the right.

Zyvx nProber Technical Specifications



Zyvx's nProber software integrates with the SEM to provide calibration, point-and-click, and semi-automation.

Positioners

- Number of positioners: 8
- Closed Loop
- X, Y, Z course resolution: 1-micron encoded
- X, Y, Z fine resolution: 2 nm open loop
- X, Y, Z range of motion: 12 mm
- Degrees of freedom: 3
- I/O per positioner: 5

Center Stage Range of Motion

- X: 28mm Y: 28 mm Z: 13mm
- X, Y, Z resolution: 5 nm encoded
- X, Y, Z accuracy: Better than 200 nm inside a 300 micron box
- X, Y, Z repeatability: Better than 100 nm
- Navigation Method: Point/Click, Joystick, and CAD Software
- Load-lock sample exchange: interlocked with control software
- Max Sample Size: 12 mm X 12 mm X 4 mm

Electrical Measurement Capabilities

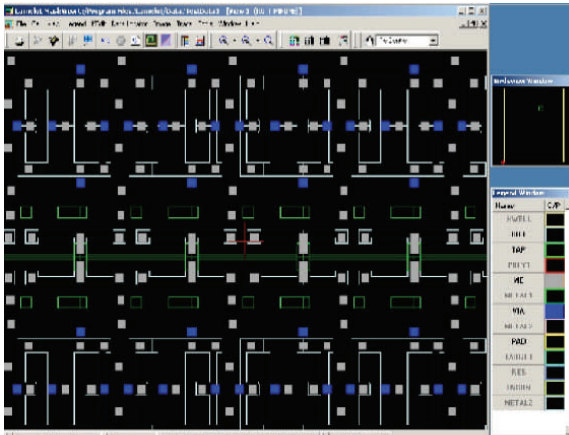
- 0.1 fA resolution
- Better than 200 fA accuracy
- Max Voltage per positioner: 100 V
- Max Current per positioner: 200 ma
- Resistance per line: Less than 10 ohms

Software and Control

- Windows-based operating system
- Joystick movement
- Point/Click navigation for center stage and software
- CAD Navigation capable
- Step-by-Step IC probing User Interface
- Data archiving module (DataViewer)

SEM Enhancements

- Greater than +/- 70 microns of beam shift
- Knob-based user control board
- Completely dry-pumped with two scroll pumps
- Industrial-designed UHV load-lock
- Flood ion gun *in-situ* cleaning package
- Advanced sample and chamber cleaning system



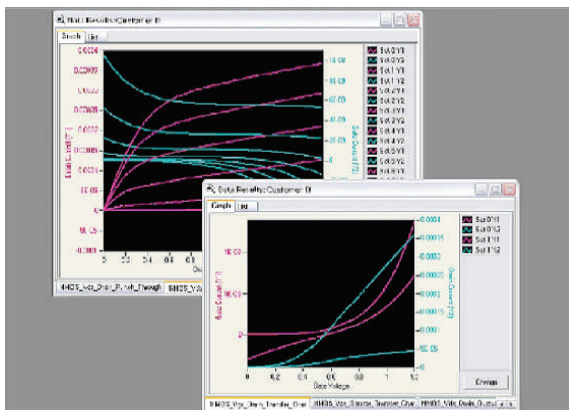
Knight's Camelot software utilizing Zyvx's high-resolution center stage to automatically navigate to the site of interest.

System: Prober + SEM

- Operating Voltage: 220V
- Facilities: Contact Zyvx for complete facilities document

Additional Accessories

- Zyvx NanoEffector® ultra-sharp tungsten Probes
- Temperature Characterization Package
- EBC Characterization Package
- CV Characterization Package
- Pulsing Characterization Package



Zyvx DataViewer software displays transistor characteristics from 32 nm node technology (probed at the contact level).

To place an order, call us toll-free at **1.877.ZYVEX99 (1.877.998.3999) ext. 271** or direct at **972.792.1671**. For the most up-to-date information, please visit our website at www.zyvx.com or email sales@zyvx.com.

