

# SPECIALTY PROBE SYSTEMS

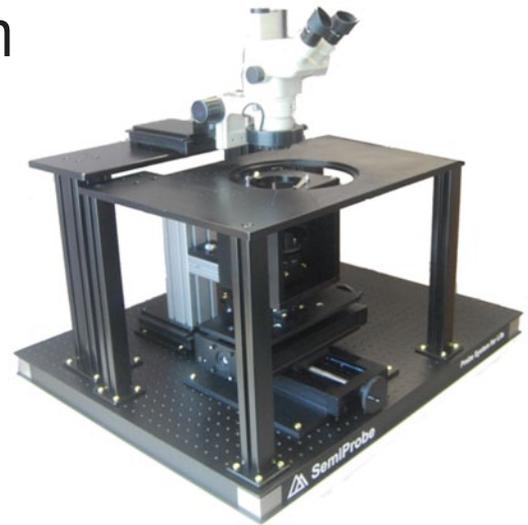


## DATA SHEET

# Magnetic Stimulation System (MSS)

Controlled position of a stimulation magnetic source for semiconductor probing.

The system manually controls the position of the device under test (DUT), the contact probes, the microscope, and the magnetic source.



## APPLICATIONS

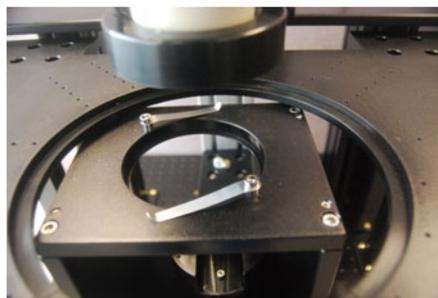
- Memory - FRAM, FeRAM, MRAM, Spintronics
- MEMS
- Material Science

## SYSTEM ARCHITECTURE

The Magnetic Stimulation System (MSS) is built using our patented Probe System for Life (PS4L) adaptive architecture which provides unsurpassed flexibility and significant capital equipment savings. Unlike traditional probe systems, all foundation modules – bases, stages, chucks, microscope mounts, microscope movements, optics, manipulators and more – are interchangeable, making the PS4L the consummate solution for many different applications and budgets. This unique modular design enables customers to acquire test capabilities that precisely match their requirements. More important, as the environment or test conditions change, the PS4L can easily be field-upgraded to meet these new demands. With this design philosophy, PS4L customers realize substantial time and cost savings over traditional probe systems because they do not need to invest in a new platform when wafer size, levels of automation, or test requirements change.

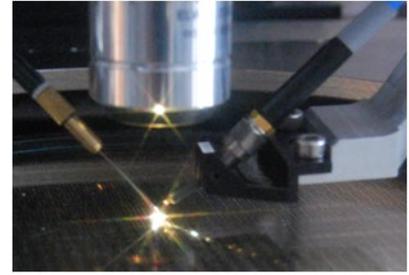
## OPERATING PROCEDURES

The system has been developed to provide the optimum control of every aspect of your test. In order to gain the minimum distance from the DUT to the magnetic source, an ultra-thin glass chuck is used. The wafer or fragment is held in position using two non-ferrous clamps. The chuck system is located on the top of a stage with independent X, Y, Z and theta control. It is open directly under the chuck for the magnetic source and magnetic source positioning system. The chuck plate has a built-in planarization system.



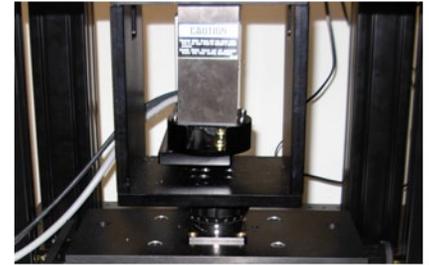
## PROBING

The system is designed to use standard DC probes on individual manipulators, probe cards, probing wedges or HF/Microwave probes. The number of probes and overdrive of the probes is limited due to the thin glass chuck used to hold the sample. Manipulators are held in place using magnetic, vacuum or bolt down bases. Bolt down bases provide the most strength and rigidity.



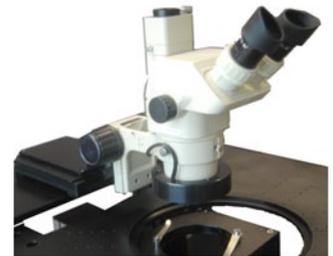
## MAGNETIC SOURCE CONTROL

The magnetic source is held on a unique holder designed to provide a rigid mount that maintains multiple degrees of freedom for positioning in relationship to the DUT. Because the cooling lines and power lines come from under the magnetic source, the holder has an open bay to accommodate this wiring. Directly beneath the magnet holder, a Z unit provides 25 mm (1") of vertical adjustment to allow the magnetic source to be moved with precision into close proximity of the bottom of the chuck. Typically, the magnetic source can be moved within 4 to 5  $\mu\text{m}$  of the bottom of the DUT. This structure is mounted onto an X-Y stage attached to the base of the probing system. An adjustable arm allows for gross adjustment of the Z position for the magnet system to allow for magnetic sources of different heights. Because the magnet is located within the vertical supports for the chuck system, the magnet has X, Y, Z and theta position control.



## MICROSCOPE CONTROL

The microscope movement is mounted onto a rigid bridge design. The movement itself is a low profile coaxial design that allows for easy adjustment of the microscope in X and Y with the motion of a single hand. Microscope movement is 50 mm x 75 mm (2" x 3") in X and Y. In addition, the microscope is mounted on the movement using a pole style mount. This allows the microscope to be moved vertically above the probing area for setup or to accommodate auxiliary objective lenses. The system has traditionally been used with StereoZoom optics. Compound microscopes with higher magnification and better resolution can also be accommodated by the system.



## OTHER COMPONENTS

All components and fasteners used in the system are non-ferric. The platen is aluminum with a durable hard powder coat finish. It is mounted on rigid posts. Because of the height of the system necessitated by the height of the magnetic source, rigid platen mounts are required.

## OPTIONS & ACCESSORIES

### MAGNETIC SOURCE

The magnetic source may be provided by the customer or purchased as part of a turnkey system. If a nonstandard magnetic source is provided, integration charges for NRE may apply.



## VIBRATION ISOLATION SYSTEMS

In order to protect your device from the effects of vibration, it is highly recommended that the system be installed on a vibration isolation system.

## AIR PUMP

If your facility is not equipped with compressed air for the vibration isolation system, SemiProbe can supply you with an appropriately sized pump.

## LINEAR POSITIONING SCALES

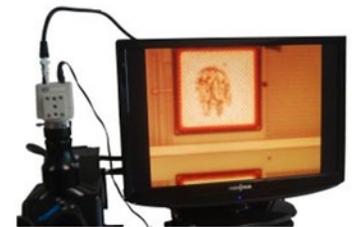
Some applications require the accurate recording of the precise position of each of the stages used in the test setup. For this application, SemiProbe offers linear scale systems for the axis of motion requiring monitoring. This option alters the cost of the system significantly so we recommend that only axis with positions that need to be recorded be equipped with this option.



## CCTV SYSTEM

In both a teaching environment or a research environment where it is advantageous for multiple colleagues to view the test setup, a CCTV system is ideal.

- Dark Box
- Wafer stages and travel range
- Microscope movements and travel range
- Microscopes
- Manipulators, probe arms and bases
- Probe tips
- Additional glass wafer chuck sizes



## SPECIFICATIONS

<b>Stage</b>	<b>X-Y Travel:</b> 205 mm x 205 mm ( 8" )
	<b>Z Travel:</b> 25 mm (1")
	<b>Theta:</b> 15 degrees
<b>Microscope Movement</b>	Coaxial ( X, Y ) : 50 mm x 75 mm ( 2" x 3" )
<b>Glass Chucks</b>	100 mm
	150 mm
	200 mm
<b>Optics</b>	7x to 90x StereoZoom with LED Ring Light
<b>Utilities</b>	Power: 110/220V AC, 50-60 Hz, 10A