PLC50

100 mm Manual Cryogenic Probe System

DATA SHEET

The PLC50 is the most cost-effective and simple, yet highly-precise probing solution for wafers and substrates up to 100 mm at cryogenic temperatures. Specially designed for laboratory requirements, it supports a wide range of applications, including I-V, C-V and RF, and can be used for probing down to 77 K with liquid nitrogen or 4 K with liquid helium. Application flexibility is ensured for DC and RF measurements of the latest silicon, compound semiconductor and superconductor devices. RF tests are supported by a wide range of probes, calibration substrates and other accessories, as well as WinCal XE™ calibration software. The unique LRRM, LRM+, NIST-style TRL and hybrid calibration methods are available with the WinCal XE wafer-level calibration and measurement software.

The PLC50 is equipped with a stable vibration isolating frame. The high-vacuum chamber with a hinged topside lid and an optical window made of quartz glass contains flanges for vacuum-tight mechanical feedthrough drives. Thus the chuck and up to six vacuum-type positioners can be easily operated from outside via cardan shaft. The high-vacuum pumping system consists of a wide-range Turbo-Molecular Pump (TMP), a diaphragm forepump, and a full-range vacuum gauge. This ensures ice- and condensation-free probing.

The chuck stage and chuck are located inside the vacuum chamber. The probe platen is designed to mount up to six vacuum-type positioners on magnetic feet. For step-and-repeat contacting, the probe platen can be lifted up and down from outside the chamber by a unique mechanical drive. A high-resolution video microscope is mounted above the view-port.

The PLC50 can be customized with a number of instruments, including various video microscopes, laser cutters and optical topology measurement tools, or black bodies for exposure of the DUT with controlled IR radiation.

FEATURES / BENEFITS

Flexibility	Customized to meet user's requirements Different substrate carriers for wafers up to 100 mm or single dies Cooling sequence of chuck and shield controlled by cold valves Use of both, LN2 and LHe Wide range of measurements (I-V, C-V, two-port, multiport and differential RF)
Stability	High accuracy, ideal for small structures Highly stable mechanics with a massive welded frame with vibration dampers
Ease of use	Simple, straightforward design for easy and ergonomic operation Quick and ergonomic change of DUT through hinged topside lid
High measurement throuput	Independent control of chuck and positioners for fast step-and-repeat testing of the whole wafer Platen lift (up and down) for simultanous separation of all probes

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Note: For physical dimensions and facility requirements, refer to the PLC50 Facility Planning Guide.

SPECIFICATIONS*

Chuck Stage	
X-Y travel	50 mm x 50 mm
Extension	80 mm x 80 mm (optional)
Positioners	
Type	Up to six vacuum-type positioners with cardan shafts and probe cooling
View Port	
Diameter	60 mm
Material	Quartz glass (others available upon request)
Working distance	80 mm, optional 30 mm
Chuck	
Wafer chuck	50 mm, 75 mm or 100 mm
Universal chuck	Small dies, wafer fragments
Temperature range	4 K to 400 K
Temperature extensions	Up to 675 K (optionally up to 450 K or 650 K)
High-Vacuum Pumping System	
Vacuum level	10^{-5} mbar
Pump types	Diaphragm and turbo-moleculare drag pumps
Vacuum gauge	Full-range Pirani / cold-cathode
Manual Microscope Support	
Travel range	50 mm x 50 mm
Z travel	~ 50 mm
Video Zoom Microscope	
Zoom range	12x, optional 16x
Magnification	1.16x - 14x
Resolution	9 µm - 2 µm

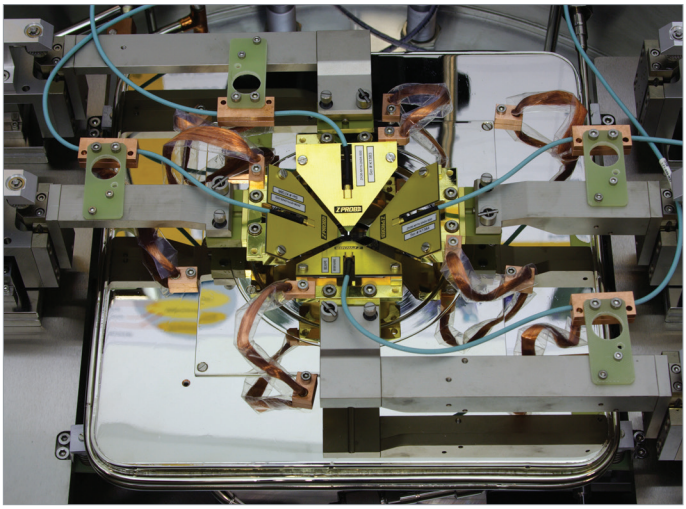
** Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously.*

APPLICATIONS

Advanced silicon technology

Compound semiconductor devices

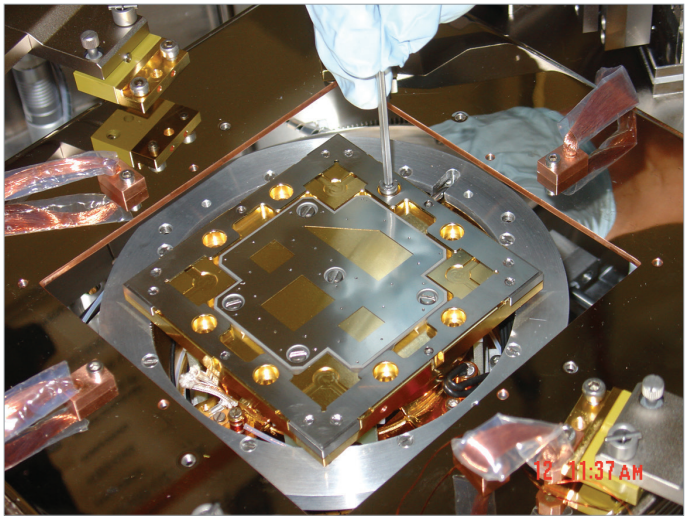
Superconductors



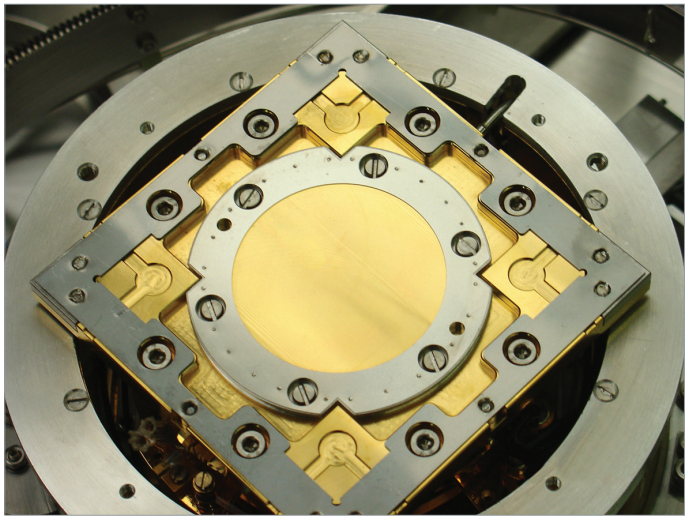
Test of wafer with four Multi |Z| Probes®.

HANDLING

All knobs located outside of the chamber ensure easy and precision control of the chuck stage and positioners. The hinged topside lid allows quick and ergonomic loading and unloading of the DUT, as well as easy probe configuration and probe tip exchange. A swivel mechanism, a part of the microscope station, allows convenient access to the topside lid.



Fixing universal carrier.



2 inch wafer carrier.

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Data subject to change without notice.

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