INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Item Description: Semi-Automatic wafer probe station (QTY: 01 No.)

PR NO. 1000050393 **RFx No. 6100002455**

Sr. No.	Detailed Technical Specification	Technical Compliance (YES / NO)	Additional Information (if any)
1.	**Key Generic Requirements:**		
i.	The tenderer must provide an installation scheme showing the physical space (footprint) of the machine(s) as well as space required for routine access and installation, including other related accessories.		
ii.	The vendor should have installed similar types of systems in technical institutes or government research labs. Minimum two Purchase order (PO) and user list should be provided as supporting evidence.		
iii.	The compliance sheet should be provided by the vendor. Failure to submit the compliance sheet may result in the rejection of the bid.		
iv.	For each compliance, supporting evidence such as manuals and other necessary and supporting documents needs to be provided.		
v.	The vendor should have an Indian representative who can take care of the urgent troubleshooting or any process-related queries on an urgent basis.		
2.	**Technical Specifications (Generic):**		
i.	The system must be cleanroom compatible.		
ii.	The machine must be software-controlled with appropriate software and hardware to protect the machine from any possible operational or non-operational failure, thereby ensuring the safety of the operator and the machine.		
iii.	The system must contain all the necessary sensors and controls to aid in safety monitoring, performance monitoring, automatic operation, and diagnostics. A complete set of system operation and maintenance manuals must be provided.		
iv.	The control system should be state-of-the-art, featuring a pre-loaded operating system and the necessary software to **run** (operate) the machine.		
v.	The software must allow for configurable user groups with different access privileges. Three different modes: operator, engineer/service, and admin should be provided for easy and safe tool handling.		
vi.	The software must provide complete system monitoring and recording of full system states in log files.		
vii.	The system must provide access to sample process tool operation history and security protocols.		

viii.	The system must provide system fault detection and		
ix.	Automatic and manual control modes should be available in the software. The system should provide programmable control over all the measured parameters.		
	Technical Specifications (Specific):		
3.	**Semi-Automatic wafer probe station:** **Purpose:** 300mm Wafer probe-station enables On-Wafer DC Characterization of (device type /application) with minimum parasitic influence. The system should support verification of (device type). The System shall consist of a semi-automatic probe station, which must be able to interface (with all necessary adapters, cables, etc., with minimum loss). The probe station shall be integrated with a high-resolution microscope, a Chuck capable of holding a wafer with a diameter of up to 300mm. The probe station shall be integrated with a high-resolution microscope, a Chuck capable of holding a wafer with a diameter of up to 300mm. The probe station shall also include an EMI shield and a light-tight chamber for wafer probing. shall be integrated with a high-resolution microscope, a Chuck capable of holding a wafer with a diameter of up to 300mm. The probe station shall also include an EMI shield and a light-tight chamber for wafer probing. shall also include an EMI shield and a light-tight chamber for wafer probing.		
i.	The Probe System must be able to support the following on-wafer measurement setup- 300 mm wafer with automated step and repeat measurement		
ii.	Probe System Integration- The system must be able to integrate with any instrument brands and types for all DC measurements of semiconductor devices for On-Wafer and Device Level characterization.		
iii.	EMI/Light-Tight shielding a. The system should be equipped with an advanced electromagnetic, radio frequency/ Light-Tight Box that meets following specification. b. EMI Shielding > 30 dB (typical) @ 1 kHz to 1 MHz c. Light attenuation ≥ 130 dB d. Spectral Noise Floor ≤ -180 dBVrms/rtHz (≤1MHz) e. System AC noise ≤ 5 mVp-p (≤ 1 GHz)		
iv	Integrated lever with 1 µm repeatability to bring probe needles and wafer chuck into a safe distance.		
v	Mechanical Performance Specification of Probe System		
4	Chuck Stage Movement : Automatic		
i.	Chuck X-Y Stage : Independent software X and Y Axis control of the chuck stage		
ii.	X-Y stage travel range : ≥ 310 mm (X axis), ≥ 335 mm (Y axis)		
iii.	Chuck Z Stage: Optimized programmable Z Stage movement to keep the DUT in focus during probing. Chuck Z travel range of minimum 30 mm for convenient loading and easy contact adjustment for different probing setups.		
iv.	Chuck Theta Stage : Theta Stage travel range : ± 5.0° fine chuck theta rotation		
v.	Platen : Ridged probe platen design with integrated air-cooling		

vi.	Platen maximum number of positioners : Capacity to hold up to 8 micro positioners		
vii.	System control access and marking: The system should have easy access and clearly marked vacuum control, integrated service loop for stable X-Y Stage movement. All Safety Haza rds must be clearly label and indicated		
viii.	Probe system control software: a. Probe system control software should include basic function such as automatic control of X, Y, Z and Theta stage movement. b. Alignment of wafer in automatic, two points and quick touch alignment. c. Auto die sizing, wafer map generation must be included. d. Point and shoot movement and manual control using joystick, keyboard/mouse and touch screen operation must be included. e. Displaying wafer image clearly and able to do prober movement operation from the image. f. Software should support die to die automatic stepping as well as sub-site stepping. g. Software should able to do X, Y and Z automatic compensation during the automatic stepping. h. Software should be able to program from the external test software using USB-GPIB (IEEE 488.1 and 488.2 compatibility) with up to 1.5 MB/s data transfer rates. i. Built-in FIFO for read/write operation. j. Automated wafer size detection and visualization in software for safe and convenient operation need to be included.		
5.	300 mm Non-Thermal Modular Chuck		
i.	Single-Die: ≤ 5 x 5 mm		
ii.	Maximum Wafer Size Support		
iii.	Chuck Diameter		
iv.	Chuck Electrical Connection : Force and sense		
v.	Chuck Surface : Planar with vacuum holes actuation		
vi.	Chuck Surface Flatness or Planarity : ≤ +/-5 µm or better		
vii.	Chuck Vacuum actuation : Software control automatic switch between center, 75 mm, 150 mm, 200- and 300-mm zone for different wafer size		
viii.	Supported wafer thickness: ≥ 100 µm		
ix	Door sensor to stop chuck movement for safer operation		
X	Integrated hardware control panel for operating all motorized stages and axis at different needs including die indexing and provide chuck contact separation		
Xi	For testing various DUTs and wafer sizes and for 300 mm chucks-5x vacuum channels in front 5x5 mm, 75 & centric 150, 200, 300 mm		
Xii	Stainless steel chuck top with vacuum rills, supporting different wafer size		
6.	Microscope System		
i.	Stable Microscope Bridge Mount: Single-tube Microscope		

ii.	Single tube microscope with optical zoom factor 1.25x - 15.0x (12:1) for large field of view and extremely high magnification		
iii.	High Resolution Microscope with camera port with 46 mm working distance		
iv.	32 mm focus block with fine and fast movement, 140mm pneumatic lift function for easy probe placement		
v.	Optical Resolution: ≤ ±1.6 µm		
vi.	Co-Axial LED illumination		
vii	C Mount Adapter		
viii	Digital Camera for image capturing and live view		
ix.	Camera Resolution: 3.2 MP High Definition Standard		
x.	Software: Integrated to probe station control software		
xi.	Touch screen LED Monitor: To view and connect with Digital camera for live view		
xi.	Resolution: ≥ 2048 x 1538 pixel or better		
xii	Image sensor: 1/1.8-inch GS-CMOS		
xiii.	Frame rate: 120 fps		
xiv	Pixel size: 3.45 x 3.45 micron		
	Input: HDMI and USB/ DVI/ VGA input		
xv	Microscope Movement: a. Precision 50 mm x 50 mm X-Microscope movement or better b. Linear movement for independent operation of X & Y movement		
7	Positioners and Accessories		
i.	Micro Positioner for DC measurement: a. 4 DC Positioners with coaxial probes and cables. The manipulator should allow attachment of RF and kelvin probe arms if needed. b. Made of Carbon Steel Material Strong Magnetic base with on-off switch c. Screw Resolution: 300 µm d. Travel Range (X, Y, Z): 13 mm or more e. Screw Resolution: 300 µm		
ii.	Probe arm (4 Nos.): a. Universal adapter for DC arms b. Convenient, and tool-less arm exchange and Easy adjustment of the height or probe angle. c. Stainless steel tube for high-temperature operation up to 300 °C. d. SMB connector for easy cable replacement. e. Gold-plated with variable 45°, 60° and 180° probe tip clamping.		
iii.	Coaxial Cables : 2 M Cables for coax probe arms with 90° SMB to straight BNC connector		
iv.	Micro Positioner Mounting : Magnetic mount on platen		
v.	DC Probe Tips : 25 Nos.		

vi.	DC probe tip configuration: a. Tungsten Material Probe tips b. 1µm Tip Radius c. Single Position DC probe with replaceable tips		
vii.	Triaxial Kelvin Interface: a. 8 BNC feed thru connectors on panel that placed at a convenient location on the probe system b. Two connection panels - each panel includes 4 Kelvin triaxial (3-lug) and feed-through connectors (female). c. The interface supports single triaxial and dual Triax SMU cable connectors. d. To be mounted on the microscope bridge with Shielded environment.		
viii.	Suitable Rocking Piston Type Vacuum Pump with particulate filter: a. Max. Air Displacement: 106/120 L/min b. Vacuum power: -700 mmHg/-93.3kPa or more c. Absolute pressure: 60 mmHg / 8.0 kPa d. Audible Noise: 56 dB or less e. 220 - 240 V AC, 50/60Hz		
8.	Certifications: As per Indian standard or equivalent, TÜV and SEMI S2 compliance, 3rd party verification of safety and ergonomic requirements.		
	Essential General Requirements:		
	a. Warranty, Start-Up Assistance and other general requirements		
	b. Facilities requirement specification to be provided at least two (02) months prior to installation.		
9.	The supplier shall furnish along with the system two sets of the following documentation, in well bound sets/volumes of good print quality: a. Instruction Manual: The manual shall, through the medium of sectionalized technical documentation (printed text, tables, graphics), relate and describe in detail the System's mechanical, electrical, structural, operational and maintenance features and functions and their theoretical analysis from the most basic to the total system level & trouble shootings. b. All standard manuals, technical data sheets and other pertinent information offered by the manufacturer of functional electrical and mechanical modules used in the System shall be included in the manuals. **c.** All manuals should be in English.		
i.	Detailed customer list along with contact details of minimum 2 customers/ users in India as proof of acceptance of the item should be provided accordingly		
ii.	Vendor should furnish Authorization Certificate from the OEM		
iii.	Vendor should be agreeable for on-site after sale service for five (05) years.		

iv.	Vendor should provide on-site Start-Up Assistance to IIT Bombay Engineers for three (03) working days for no extra charge.		
v.	Refurbished equipment are not acceptable.		
vi.	Supplier has to provide certificate of calibration along with the supplied instrument.		
10.	**Installation and Qualification:** Installation and on-site qualification of the system by the OEM. a. Vendor shall demonstrate full functioning of the system at IIT Bombay after installation. b. Current-Voltage (IV) and Capacitance-Voltage (CV) measurement of samples (chips ranging from 10x10 mm to 300 mm wafer) with Semiconductor parameter analyzer with 4 SMUs connected through triax cables all the way to the probe tip (for IV). Required instrument to be provided by IIT Bombay. Interfacing software to provide by vendor. c. Noise floor measurements of DC current of 100 fA in open configuration and 10 fA in shielded configuration. d. Probe station levelling and connect the scope, monitor. e. Hook up of utilities f. Demonstration of **Initialization of** software for semi-automated measurements, with wafer map and aligning (for manual wafer load/unload).		
11.	Training: On-site operational training for two engineers, covering system operation, minor troubleshooting, maintenance, and process control		
12.	1 year standard Warranty		