

**Technical specifications of  
MICRO-MANIPULATED, CRYOGENIC, HIGH FREQUENCY VACUUM PROBE  
SYSTEM**

Sl. No.	Parameters / particulars required
1	<p><b>Chamber design:</b> Micro Manipulated Vacuum Cryogenic Probe System</p> <ul style="list-style-type: none"> <li>○ Vacuum chamber should have provisions of at least six (6) ports for connecting independent micro-manipulated probe stations. At least two (2) independent micro-manipulated RF probe stations should be included and four (4) blank ports for future upgrade.</li> <li>○ The chamber should have a top at least 2'' diameter O-ring sealed fused quartz IR absorbing viewport to ensure clear viewing of the sample area and all the probes.</li> <li>○ The cryostat should be continuous flow cryostat system and the probe station should have variable temperature ranging at least 10 K or better up to 450 K and should be compatible to cooling source Liquid helium (LHe) and liquid nitrogen (LN<sub>2</sub>).</li> <li>○ Sample cooling assembly should have 2-stage flow cryostat i.e. sample and radiation shield.</li> <li>○ Base Plate with Vibration-Damping Leveling Mounts should be included.</li> <li>○ Radiation shield should be completely surrounded to sample.</li> <li>○ Grounded sample holder should accommodate at least 2 Inch wafer size with a minimum probe area of 1 inch.</li> <li>○ Sample illumination with coaxial and ring light from an adjustable light source and power.</li> <li>○ Cooled and highly polished radiation shield to reduce the total heat load on to the cold head, including cooled top 2'' diameter clear view quartz window for achieving lowest possible sample temperatures.</li> <li>○ A High efficiency multilayer shielded flexible transfer line with optimized radiation shielding to be supplied.</li> </ul>
2	<p><b>Probe arms/probe station:</b></p> <ul style="list-style-type: none"> <li>○ Two numbers of Micro-manipulated stages providing 25 mm total travel along the probe axis (X-direction), 25 mm total travel in the horizontal direction perpendicular to the probe (Y direction) and 10 mm total travel along the vertical direction perpendicular to the plane of the sample (Z-direction). Each stage should be capable of 5 micron sensitivity. Additional 25 mm in X-direction by manually moving the probe arm in and out with a total of 50 mm X-travel; thermal radiation shields, stainless steel welded bellows, and feedthrough ports - including probe arm, base and appropriate probes, probe-tip and cables for measurements up to 40 GHz.</li> <li>○ Two numbers of 7 Inch hermetic semi rigid microwave coaxial probe cable with K (SMA compatible) plug at probe end and K (SMA compatible) socket at</li> </ul>

	<p>feedthrough end for measurements up to 40 GHz with GSG probe.</p> <ul style="list-style-type: none"> <li>○ Two numbers of GSG microwave probe, K-connector, 40 GHz, 50µm pitch, non-magnetic.</li> </ul>
3	<p><b>Temperature controller:</b></p> <ul style="list-style-type: none"> <li>○ Minimum three independent temperature sensor channels, with precise temperature measurement ranging from at least 10 K to 675 K and controller unit using PID controller with accuracy of <math>\pm 0.5</math> °K and provisions to interface with the personal computer.</li> <li>○ At least three independent temperature sensors should be included at the probe arm, sample stage and radiation shield.</li> </ul>
4	<p><b>Imaging system:</b></p> <ul style="list-style-type: none"> <li>○ The system should include an integrated high resolution (at least 5 µm) imaging system with USB camera for easy viewing and capable of taking pictures. Field of view should be between 2 mm to 8 mm.</li> <li>○ It should include Fiber optic ring guide and light source.</li> </ul>
5	<p>The probe station system must allow integration of two high frequency PCBs in both probe arms and should be capable to interface with picosecond pulse generator and electrical characterization instruments including Arbitrary waveform generator and DSO measurement units.</p>
6	<p><b>Warranty:</b> At least 1 year standard warranty</p>
7	<p><b>Optional items:</b></p> <p>The following optional items should be quoted separately.</p> <ul style="list-style-type: none"> <li>a) <b>Vacuum pumping system:</b> Suitable Turbo pumping station with gauge; dry pump and control system to achieve <math>1 \times 10^{-6}</math> mbar should be provided.</li> <li>b) <b>Vibration Isolation:</b> Vibration isolation for chamber and the vibration level even after upgrading to cryogenic version should be at least <math>\pm 25</math> nm or better with positional drift of <math>\leq \pm 80</math> nm (peak-to-peak) in 30 min.</li> <li>c) <b>Liquid Nitrogen storage Dewar:</b> 50 liters preferably made of aluminum liquid Nitrogen storage Dewar and inlet adapter with suitable O-ring seal to accept the probe station transfer line featuring pressure gauge, pressure relief valve, pressurization valve, roller base.</li> </ul>

**Additional Requirements:**

- OEM should provide necessary service of operation certificate.

**Note to Vendors:**

- Vendor to provide technical compliance for all the specs mentioned with the quotation.
- Vendor to provide user list with the quotation
- Representatives/Distributors quoting on behalf of OEM should submit authorization certificate with the quotation.