

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR**  
**Department of Electrical Engineering**

Enquiry No.: EE/YSC/2017/12

Opening Date: 24<sup>th</sup> July, 2017

Closing Date/time: ~~10AM on 8<sup>th</sup> August, 2017~~ **10AM on 14<sup>th</sup> August 2017**

**Sub.: Purchase of Pulsed-IV and Pulsed-RF Measurement System**

Our organization is an educational institute of the repute and liable to get education discount from manufacturer. Please send sealed quotation, to undersigned, for the same.

There will be two steps in the tender process:

1. Technical specifications with compliance table should be put in one sealed envelope. SPECIFY company name and component number, and attach detailed technical specification for each part/component. Also attach technical brochure from manufacturer.
2. Financial details i.e. budget quotation should be in a separate sealed envelope. This quotation will not be opened if technical details of the product do not match with our specifications.

**Specifications:**

- Please see technical specifications and compliance table. Mark, whether your system complies or not with the specifications along with details.
- Parent company should be an established company with after sales support in India.
- Vendor must provide 3(THREE)-years warranty for all parts/components and servicing.

**Technical Specifications and Compliance table:**

<b>(1) Pulsed IV and S-Parameters Measurement Software Capabilities</b>			
<b>S.N.</b>	<b>Specifications</b>	<b>Compliance Yes /No</b>	<b>Comments</b>
<b>1.1</b>	<u>Instrumentation Control</u> <ul style="list-style-type: none"> <li>• Software suite must be compatible with commercial network analyzers from Keysight and R&amp;S when properly equipped with pulsed measurement options</li> </ul>		
<b>1.2</b>	<u>Pulsed Measurements</u> <ul style="list-style-type: none"> <li>• Software should be able to take DC and Pulsed IV measurements using the hardware listed in Section 2</li> <li>• Software should be able to take synchronized pulsed IV and pulsed S-parameters measurements</li> <li>• Software should be able to take pulsed IV and CW s-parameters</li> </ul>		
<b>1.3</b>	<u>Chronogram</u> <ul style="list-style-type: none"> <li>• Software should be able adjust chronogram for independent timings of gate and drain bias (on and off), DC measurement window, RF source on/off and RF source measurement window</li> </ul>		

1.4	<u>Measurement Sequencing</u> <ul style="list-style-type: none"> <li>Software should allow the definition of linear step, adaptive step or custom step Vg and Vd values</li> </ul>		
1.5	<u>Data Management</u> <ul style="list-style-type: none"> <li>Software should allow export of measurement data for use in commercial model extraction platforms such as Keysight ICCAP</li> </ul>		
1.6	<u>Stop Conditions</u> <ul style="list-style-type: none"> <li>Software should have protection in the form of stop conditions which will terminate measurements when conditions are met including reverse and forward currents and powers.</li> </ul>		
1.7	<u>Pulsed Profile</u> <ul style="list-style-type: none"> <li>Software should be able to recreate pulsed profile shapes to plot measured data as a function of time within the DC pulse.</li> <li>Software should be able to simultaneously plot two or more sets of IV curves at different times within the DC pulse</li> <li>Software should be able to plot IV curves at 20 ns intervals (in conjunction with hardware described in Section 2)</li> </ul>		
1.8	<u>Post-Processing</u> <ul style="list-style-type: none"> <li>Software should be able to compute gm/gd</li> <li>Software should be able to convert IV data sets</li> <li>Software should be able to interpolate and extrapolate IV measurement data</li> <li>Software should be able to embed and de-embed S-parameter measurement files</li> </ul>		
1.9	<u>License Support</u> <ul style="list-style-type: none"> <li>Vendor should provide perpetual license. Vendor to provide 1 year upgrade and support for the software.</li> </ul>		
1.10	<u>Software Upgradability</u> <ul style="list-style-type: none"> <li>Software should have upgrade option to include compact transistor model extraction for III-V devices within the software platform</li> <li>Software should have upgrade option to include load pull measurements within the software platform</li> </ul>		

**(2) Pulsed IV System**

S.N.	Specifications	Compliance Yes/No	Comments
2.1	Pulsed IV system having capability of measuring/providing Gate current & voltage and Drain current & voltage together.		
2.2	Gate Pulser Voltage : +/- 25V Current : +/-1A Pulsed Power : 10W Duty cycle : 0-100%		

		<p>Pulse width (min) : 200ns</p> <p>Pulse width (max): 40s with no voltage drop</p> <p>Settling time : 50ns to 95% with no load</p> <p>Voltage setting resolution : 16 bit</p> <p>Measurement resolution: 16 bit</p> <p>Voltage : 1mV</p> <p>Current : 35uA to 1A, 0.35uA to 10mA, 4.8nA to 100uA</p> <p>Pulser must contain internal protection circuitry</p> <p>Pulsed current : 1.3A with 60ns response time</p> <p>Avg current : 360mA with 100ms response time</p> <p>Avg power : 3.5W with 100ms response time</p> <p>Over voltage : programmable with 150ns response time</p> <p>Single measurement sweep across entire voltage and current range</p>		
2.3	Drain Pulser	<p>Voltage : 250V</p> <p>Current : 30A</p> <p>Pulsed Power : 3000W</p> <p>Duty cycle : 0-100%</p> <p>Pulse width (min) : 200ns</p> <p>Pulse width (max): 40s with no voltage drop</p> <p>Settling time : 50ns to 95% with no load</p> <p>Voltage setting resolution : 18 bit</p> <p>Measurement resolution: 16 bit</p> <p>Voltage 4.7mV to 250V, 90uV to 5V</p> <p>Current : 590uA to 30A, 58uA to 3A, 5.5uA to 300mA</p> <p>Pulser must contain internal protection circuitry with 50ns response time</p>		

		Single measurement sweep across entire voltage and current range		
2.4	Mainframe	Vendor shall provide mainframe to <ul style="list-style-type: none"> <li>- Control gate and drain pulsers</li> <li>- Contain two DC power supplies of 250V/5A each with a maximum delivered power of at least 120W with 18-bit resolution</li> <li>- Contain a triggering interface for master and slave operation to control pulsed triggering, measurement triggers and synchronization triggering of multiple mainframes, RF triggering</li> <li>- Be capable of supporting multiple pulser configurations</li> <li>- Be expandable up to 32 pulsers</li> <li>- Ethernet and USB interfaces</li> <li>- Interface cables between mainframe and pulsers</li> <li>- Direct hardware programmability through SCPI commands</li> </ul>		
2.5	Warranty	One year on parts and labor		
<b>(3) Measurement System Installation and On-Site</b>				
Sr. No.	Specifications		Compliance Yes/No	Comments
3.1	Vendor shall provide onsite installation and training which should include <ul style="list-style-type: none"> <li>- Hardware setup and connection to customer VNA and probe station</li> <li>- Software installation on customer-supplied PC</li> <li>- System performance verification</li> <li>- Training on the use of the measurement system</li> </ul>			
3.2	Vendor shall provide online demonstration of measurement during technical evaluation process			

**Note:**

1. Your quotation shall contain Authorization Letter from manufacturer specifically for this tender.
2. Quotation must be valid for 90 days.
3. Delivery period should not be more than **10 weeks**.
4. Send complete detail of the product(s) including brochure from manufacturer.
5. Price must include all taxes and charges.

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