

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

Enquiry No.: EE/YSC/2013/14  
 Opening Date: 13<sup>th</sup> September, 2013  
 Closing Date: 23<sup>rd</sup> September, 2013

**Sub.: Purchase of Semiconductor Parametric Analyzer**

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.
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.
- Parent company should be an established company with good number of installations and after sales support in India as well: Attach proof.
- Vendor must provide 3(THREE)-years onsite warranty for all parts/components and servicing.
- Installation charges and training should be included in the quotation.

**Technical Specifications and Compliance table:**

S. N.	Quantity	Description
1	-	Semiconductor Device Analyzer should have a upgradability and support of 10 slot modules and include a 4.2 Amp ground unit with 4 (Four) Medium Power SMU, 1 (ONE) High Resolution SMU & 1 (ONE) High Power SMU Unit, 1 (ONE) Multi Frequency Capacitance Measure unit MFCMU, Waveform generator/fast measurement unit WGF MU and support device modeling software and parameter extraction software.
2	4 (FOUR)	Medium Power SMU Range & Resolution
3	1 (ONE)	HPSMU Range & Resolution
4	1 (ONE)	HRSMU Range & Resolution

10fA / 0.5μV to 100mA/100V  
 10fA / 2μV to 1A/200V  
 1fA / 0.5μV to 100mA/100V , supports an optional atto-sense ( upgradeable ) and switch unit (ASU) that both increases the measurement resolution down to 100 aA and allows to switch in another instrument (such as a capacitance meter) without having to change any cables

5	-	Ground Unit (Maximum sink current)	4.2 A
6	-	Ground Unit (Output Voltage)	0V $\pm$ 100 $\mu$ V
7(a)	-	Knob sweep mode	In knob sweep mode, sweep range is controlled instantaneously with the front-panel rotary knob
(b)	-	Sweep Measurements	SMU's should support a unique range management feature that can prevent damage to sensitive devices when making sweep measurements. This feature can be used to prevent voltage glitches from occurring by forcing the SMU to uprange before any damage can occur
8	-	IV Sweep Mode	Single & double Staircase sweep, Pulsed sweep, staircase sweep with pulsed bias, IV sampling, CV sweep, C-t Sweep, C-f Sweep, List sweep Linear interval, log interval, stop condition, bias hold and negative hold time.
9	-	IV Sampling Capability	1ms and 100 $\mu$ S in Fast sampling, linear and log sampling
10	-	QSCV Measurement	Quasi Static CV measurement with leak compensation.
11	-	CV measurement function	Cp-G, Cp-D, Cp-Q, Cp-Rp, Cs-Rs, Cs-D, Cs-Q, Lp-G, Lp-D, Lp-Q, Lp-Rp, Ls-Rs, Ls-D, Ls-Q, R-X, G-B, Z- $\theta$ , Y- $\theta$
12	-	CV Measurement Test Signal Frequency	1kHz to 5MHz with 1mHz resolution and accuracy of $\pm$ 0.2% 10mV to 250mV with 1mVrms resolution
13(a)	1 (ONE)	IV CV measurement switching unit	<b><i>Switching unit to switch between SMUs &amp; CMU including cables</i></b> , to do IV & CV measurement without physically changing the connection & support device modeling software ICCAP and parameter extraction software
(b)	1 (ONE)	<b>Waveform generator/fast measurement unit</b>  (supports Pulsed waveform)	Waveform generator/fast measurement unit should have lower noise, higher resolution and accurate voltage source capabilities. The noise level 0.1mV RMS, minimum output voltage resolution 96 $\mu$ V. <b><i>100-nanosecond pulsed IV parametric test solution with 1 nA current measurement resolution , Dual pulse capability to apply to both gate and drain</i></b>
14	-	Arithmetic Functions & User Functions	USER FUNCTIONS should be definable using arithmetic expressions. Measured data and analyzed variables from graphics analysis (marker, cursor, and line data) can be used in computation.
15	-	Marker Analysis Function	Marker to min/max, interpolation, direct marker, and marker slip
16	-	Line Analysis Function	Two lines, normal mode, grad mode, tangent mode, and regression mode
17	-	Automatic Analysis Function	On a graphics plot, the markers and lines can be automatically located using the auto analysis setup. Parameters can be automatically determined using

			automatic analysis, user function, and read out functions.
18	-	Data variable display & analysis functions	At least 20 user-defined parameters & 20 user defined analysis functions
19	-	Trigger	Input: External trigger input starts a sweep or sampling Input Level: TTL level, negative or positive edge trigger
20	-	Interfaces	GPIB, interlock, USB (USB 2.0, front 2, rear 2), LAN (100BASE-TX/10BASE-T), trigger in/out, digital I/O
21	-	Offline software support	Offline Desktop EasyEXPERT support
22	-	Application Libraries	Application libraries for testing CMOS, FET BJTs, Diode etc.
23	1 (ONE)	<b>Test Fixture unit</b>	Test fixture for <i>testing packaged devices</i> .
24	-	Operating System	Windows 7
25	-	Control from Remote PC	FLEX, VXI plug & play
26	1 (ONE)	USB to GPIB interface cable with all accessories/software required	<b>Cable and any other accessory/software to interface USB to GPIB ports to control the unit using laptop etc.</b>
27	-	User Interface Options	Touch panel, knob, soft keys, USB keyboard & mouse
28	-	Device Modeling software support	<b>Hardware should support device modeling software and parameter extraction software, Integrated Circuit Characterization and Analysis Program (ICCAP) which is used to extract complete sets of nonlinear model parameters based on precision DC, CV, and S-parameter characterization. It enables users to easily set up measurements, perform circuit simulations and optimizations. Should support Turnkey extraction solutions for industry standard CMOS models, such as BSIM3/BSIM4, PSP and HiSIM, minimize the learning curve and maximize model accuracy.</b>  Note – We already have ICCAP software and do not add software cost in the quotation.
29	-	Future Upgradability	System should be future upgradable : High current device measurement up to 40A High Voltage device measurement up to 3000V
30	-	Triaxial Cables	<b><i>Each SMU unit must come with at least 2 (TWO) Triaxial cables supporting low current measurement below 1pA</i></b>
31	5 (FIVE)	Kelvin Triaxial Cables	Provide 5 (FIVE) extra Kelvin Triaxial cables of 3m length supporting low current measurement below 1pA
32	-	Keyboard & Mouse	Keyboard and Mouse to operate the unit.

33	8 (EIGHT)	Coaxial Cables	Provide 8 (EIGHT) extra coaxial cables of 3m length supporting low current measurement below 1pA
34	24 (EIGHT)	Triax to BNC connectors	Provide (a) 8 (EIGHT) Triax(M) to BNC(F) connectors (b) 8 (EIGHT) Triax(F) to BNC(M) connectors (c) 8 (EIGHT) Triax(F) to BNC(F) connectors  All connectors should support low current measurement below 1pA
35	8 (EIGHT)	BNC tree connectors	Provide 8 (EIGHT) BNC <b>tree</b> connectors  All connectors should support low current measurement below 1pA
<b>Warranty</b>			
<ul style="list-style-type: none"> <li>• Vendor must provide 3(THREE)-years onsite warranty for all parts/components and servicing.</li> </ul>			
<b>Parent company should be an established company with good number of installations and after sales support in India as well: Provide proof.</b>			

Note:

1. Your quotation shall contain Authorization Letter from manufacturer.
2. Quotation must be valid for 90 days.
3. Delivery period should not be more than **14 weeks** and delivery should be at IIT Kanpur.
4. Send complete detail of the product(s).
5. Payments terms: 90% on installation and 10% satisfactory report.
6. **IITK is exempted from excise/custom duty. Payment can be made in USD for import.**
7. Price must include all taxes and charges.
8. **All prices are to be FOR IIT Kanpur.**

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