ANNEXURE – I

Technical Specifications of High power device measurement solution

1.0 Bidder Eligibility Criteria-I

Sl. No	Bidder Eligibility Criteria-I	Complied / Not Complied	Reference Page No.	Remarks, If any
1	The bidder/OEM should have supplied at least 3 similar items to IITs, NITs, IISERs, CSIR Labs or other Govt. R&D organizations in the last 10 years, PO copies or installation certificates along with contact details of end user need to be submitted as the proof of supply. IIT Madras reserves its right to verify the claims submitted by the bidder and the feedback from the previous customers will be part of technical evaluation.			

2.0 Technical Specifications II

S.No	Specifications	Complied/Not Complied	Ref Page No.
	Equipment being tendered is intended for primary use in the system, which will characterize high power device measurement set up and response acquired through dedicated probe station. The integrated high power characterization system with High power Probe station will offer a guided wizard customizable for sure connections and correct setup.		
2.	Only vendors with necessary experience and competence to supply, integrate and install such functional system with all its hardware and software components will be selected as eligible bidders.		
3.	Vendor to deliver a total solution to meet the test needs for the intended research and development. Vendors may be asked to provide necessary evidence to establish their experience & expertise and it is at institute's discretion to accept/reject the same.		
4.	System should be unified measurement platform equipped for wafer level, chip or SOC device characterization supplied with all specified accessories, probes, connectors, software, calibration fixtures such that the setup is self-sustaining and able to provide DC parametric analysis, IV and CV curves & upgradable in future to test for semiconductor devices such as transistors, amplifiers, filters, other linear components to meet intended needs of the department in integrated and standalone modes.		
5.	Wherever called for within the specifications, the offered equipment must be upgradable to higher performance thresholds as defined.		
6.	Software supplied should be capable of functioning on equipment		
7.	High power device measurement system should be compatible with Cascade/Form factor probe stations		

S.No	Specifications for high power device measurement setup	Complied/Not Complied	Ref Page No.
1.	**The measurement setup is required for characterizing high-power devices like HEMTs. An integrated system supporting up to 3kV and 20A should be quoted as per the specifications below. The instrument should be capable of performing IV CV and gate charge measurement on wafer devices (both lateral and vertical) and discrete devices.**		
2.	**The instrument should be based on SMUs fit in to a single mainframe with built in controller, software/firmware to control the instrument and large in built display**		

3.	**Oscilloscope view should be available to view the pulsed waveform timings at any sweep step of the sweep output.**			
4.	**The main instrument should be upgradable up to 10kV and up to 1500A in future.**			
5.	**The main instrument should be upgradable for Current collapse measurements**			
6.	**Parameter**	**Specifications**		
7.	**Mainframe**			
8.	Number of slots	Ten or more		
9.	Ground unit	Should include a Ground unit apart from the ten slots for SMUs		
10.	Ground unit sink current	At least 4A should support Kelvin connection with Kelvin connectors		
11.	Interlock	Interlock provision should be available for user protection		
12.	Display	15 inch touch screen display.		
13.	Interfaces	GPIB, LAN, USB and VGA output		
14.	Operating system	Should come with windows 7 or better		
Fixture				
15.	A Fixture for IV testing of discrete deice should be provided supporting upto 20 A and appropriate connector 3 pin inline package device should be provided			
16.	Should have built in selector to select between High voltage and high current based on measurement without changing physical connection			
IV capabilities on different port should support the following using SMUs and accessories as a whole system				
17.	High voltage capability	Voltage Up to 3kV with minimum measurement resolution of 200uV Current measurement up to 4mA and measure resolution of up to 10fA Pulse capability of up to 500us Pulse width		
18.	High Current Capability	Up to 20A (Pulsed) with measurement resolution of 10 pA Voltage up to 20V with measure resolution of up to 20uV		
19.	Medium Current Capability (2 Nos)	Voltage up to 40 V and current up to 1 A with current meaurement resolution of up to 10pA Pulse capability of up to 10us Pulse width		
20.	Medium Power Capability (2 Nos)	Voltage up to 100 V and current up to 100 mA with current meaurement resolution of up to 10fA Pulse capability of up to 500us Pulse width		
21.	**Gate charge (Qg) measurement capability**	1 nC to 100 µC		
CV measurement capability				
22.	The integrated system should be capable of measuring Capacitance with the below specification			

23.	Frequency Range of the capacitance measurement Unit	1 kHz to 5 MHz with 1mHz(minimum) resolution with accuracy of 0.008%		
24.	In built DC Bias	0 to ±25 V		
25.	Measurement parameters must also include	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-θ, Y-θ		
26.	High voltage Bias tee to support 3kV Bias should be provided	Frequency up to 10kHz to 1MHz		
Other accessories				
27.	Other accessories including high voltage cables, Ground unit cables, capacitance measurement unit cables, Universal resistance boxes and any other adapters necessary for above mentioned connections and measurements should be included			
Software or Firmware				
28.	Software to control the instrument and other accessories for seting up measurements, Performing measurements, displaying and analyzing data and mangement of measurement data must be included			
29.	Flexibility of performing the above, either from the software installed within instrument or external controller should be there			
30.	Should have self-test, self-calibration and diagnostic menu			
31.	Graphical display, automated analysis capabilities and data generation to Excel and image for analysis and reporting			
32.	Should allow tracer test mode	Should allow interactive sweep control using a rotary knob similar to a curve tracer allowing sweep in positive direction, negative direction or in both directions		
33.	Should have the provision for sequencing multiple tests without external programming			
34.	Operating temperature range	5 to 40 degree Celsius		

Other Terms and Conditions for Bidders			
35.	Bidders must provide point-by-point compliance to all tendered Technical Specifications, Technical Requirements and Special Terms. Where required, vendor must provide compliance, deviation if any and requisite justification to meet tender requirements in total. Without such details, bids may be summarily rejected at discretion of IIT Madras.		
36.	Bids complying to only part requirements of tendered specifications are liable to be rejected. Bidder is accountable for supply, integration, installation, and support of all quoted parts including any third-party parts not manufactured by them, akin to a turnkey bid. All necessary authorisations must be obtained from third party/part suppliers confirming support to the primary bidder to quote, honour OEM warranty and support during integration, warranty period and for life of the product.		
37.	Vendors for main test equipment and probe stations must have their own		

	technically equipped application engineer / engineering team to provide installation, training and after sales support.		
38.	Primary vendor OEM should have well established repair and calibration facility for all supplied main equipment within India.		
39.	Warranty: One year on the complete integrated solution.		

(Note: It is mandatory for the bidders to provide the compliance statement in tabular column format along with catalogue page number (comply/not comply) for the Above points with document proof as required. Failing which bidders will be technically disqualified)