The Manager (Project Purchase)   Date:20.06.2023

Open Tender Reference No: PH/MSRA/124/2023/HIGHFREQEPEM

GEM NAR ID: GEM/GARPTS/20062023/C846FISV3X2Y   Due Date/Time: 10.07.2023@ 3:00 PM

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, Tenders are invited in two bid system from Class-I local suppliers and Class II local suppliers, for the supply of **"High Frequency Power Electronics Measurement (HFPEM)"** Conforming to the specifications given in **Annexure -A.**

Tender Documents may be downloaded from Central Public Procurement Portal https://etenders.gov.in/eprocure/app. Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website https://etenders.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at **"Help for contractors".** [Special Instructions to the Contractors/Bidders for the e-submission of the bids online through this eProcurement Portal"]

Bidders can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, click on "GO" button to view all IIT Madras tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website https://etenders.gov.in/eprocure/app as per the schedule attached.

1)	**Pre-bid Meeting Details**	**:**	NA
2)	**ICSR Vendor Registration**	**:**	**Vendor registration code.** Vendor registration with IC&SR (IITM) is mandatory for bidders to participate in tenders. ** For Vendor Registration & Guidelines, Please follow the website :** https://icandsr.iitm.ac.in/vendorportal; Helpdesk: vendorhelpdesk@icsrpis.iitm.ac.in

No manual bids will be accepted. All tender documents including Technical and Financial bids should be submitted in the E-procurement portal.

Last date for receipt of tender	**:**	**10.07.2023 @ 3:00 PM**
Date & time of opening of tender	**:**	**11.07.2023 @ 3:00 PM**

3. Instructions to the Bidder:

A)	**Searching for tender documents**	:	• There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal. • Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective **"My Tender"** folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document. • The bidder should make a note of the **unique Tender ID** assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.
B)	**Assistance to bidders**	:	• Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender. • Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is [0120-4200462, 0120-4001002, 0120-4001005]
C)	**Enrollment Process to Bidders**	:	**REGISTRATION** • Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal URL:https://etenders.gov.in/eprocure/app by clicking on "Online Bidder Enrollment". Enrollment on the CPP Portal is free of charge. • As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts. • Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal. • Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) • Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse. • Bidder then may log in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken. • Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name

			is a prerequisite for registration and participating in the bid submission activities through https://etenders.gov.in/eprocure/app • Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://etenders.gov.in/eprocure/app under the "Information about DSC".
D)	**Preparation of bids**	:	• Bidder should take into account any corrigendum published on the tender document before submitting their bids. • Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid. • Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender document / schedule and generally shall be in PDF / XLS formats as the case may be. Bid documents may be scanned with 100 dpi with black and white option. • To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GSTIN Details, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use **"My Documents"** area available to them to upload such documents. These documents may be directly submitted from the **"My Documents"** area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.
E)	**Submission of bids**	:	• Bidder should log into the site well in advance for bid submission so that he/she can upload the bid in time i.e. on or before the bid submission date and time. Bidder will be responsible for any delay due to other issues. • The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document. • Bidder has to select the bid security declaration. Otherwise, the tender will be summarily rejected. • A standard BOQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the detail with their respective financial quotes and other details (such as name of the bidder). If the BOQ file is found to be modified by the bidder, the bid will be rejected. • The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

			• The Tender Inviting Authority (TIA) will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues. • The uploaded tender documents become readable only after the tender opening by the authorized bid openers. • Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details. • Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet. • More information useful for submitting online bids on the CPP Portal may be obtained at: https://etenders.gov.in/eprocure/app. • All tender documents including pre-qualification bid, Technical Bid &Financial Bid should be submitted separately in online CPP portal as per the specified format only. Right is reserved to ignore any tender which fails to comply with the above instructions. **No manual bid submission will be entertained.**
F)	**Marking on Technical Bid**		• The bidder eligibility criteria, technical specification and supply of item for this tender is given in Annexure A. • The Bidders shall go through the specification and submit the technical bid. • The Technical bid should be submitted in the proforma as per Annexure-B in pdf format only through online (e-tender). No manual submission of bid will be entertained. • The technical bid should have a page-wise heading as "Technical Bid" and page no. in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents. • The technical bid should consist of bidder eligibility criteria details and all technical details along with catalogue/ pamphlet which will give a detailed description of product with technical data sheet so that technical compliance can be verified.
G)	**Marking on Price Bid**		• Financial bid (BoQ) should be submitted in the prescribed proforma format as per Annexure-C in xls format through e-tender only. No manual or other form of submission of Financial Bid will not be entertained

4)	**Preparation of Tender**: The bidders should submit the bids in two bid system as detailed below. **Bid I _Technical Bid** The technical bid should consist of bidder eligibility criteria and technical specification compliance sheet as per Annexure-B. **Bid II _Price Bid** The price bid should be submitted in excel format (BoQ) as per the proforma (Annexure C) uploaded in the e-Tender web site. The Quoted price should be for supply and installation of the item and inclusive of all cost and statutory levies at IIT Madras.

5)	**Price:**
	a) The price should be quoted only in INR net per unit (after breakup) and must include all packing, transit insurance and delivery charges to the ent of **Department of Physics.**
	b) The rate quoted shall be all inclusive of all taxes and no extra payment will be made other than statutory revisions as per the terms and conditions stipulated in this contract document.
	c) The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for custom duty (5.5%). Relevant certificates will be issued wherever necessary.
	d) The offer/bids should be submitted through online only in two bid system i.e. Technical Bid and Financial Bid separately.
6)	**Tenderer shall submit along with this tender:**
	(i) Proof of having ISO or other equivalent certification given by appropriate authorities.
	(ii) Name and full address of the Banker and their swift code and PAN No. and GSTIN number.
	(iii) GST registration proof showing registration number, area of registration etc.
	(iv) All of your future correspondences including Invoices should bear the GST No. and Area Code.
7)	**Terms of Delivery:**
	Supplier will be fully responsible for the safe carriage, Installation/Commissioning of goods up to the **Department of Physics**, IIT Madras or named place as per PO, Insurance coverage will be in the scope of the supplier.
	The tenderer should indicate clearly the time required for delivery of the item (subject to the approval of the Executive Committee-IIT-Madras). In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.
	In the event of delay or non-supply of materials/execution of Contract beyond the date of delivery/completion of job. The penalty will be levied @1% per week of delay subject to a max of 10% of the value of purchase order and if the delay is more than accepted time frame by IIT M, the PO would be partially or fully cancelled and liquidated damages will be enforced accordingly.
8)	**Period for which the offer will remain open:**
	The Tender shall remain open for acceptance/validity till: 120 days from the date of opening of the tender. However, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day.
9)	**EMD:** The EMD of **Rs. 10,00,000** to be transferred to the account details mentioned in Annexure G and proof should be enclosed in the Technical Bid. Any offer not accompanied with the EMD shall be rejected summarily as non-responsive. The EMD of the unsuccessful bidders shall be returned within 30 days of the end of the bid validity period. The same shall be forfeited, if the tenderers withdraw their offer after the opening during the bid validity period. The Institute shall not be liable for payment of any interest on EMD. EMD is exempted for Micro and Small Enterprises (MSE) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) and Startups as recognized by Department of Industrial Policy & Promotion (DIPP). (MSE/MSME/DIPP PROOF should be enclosed in the cover containing technical bid).

10)	**Performance Security: -**
	The successful bidder should submit Performance Security for an amount of 3% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD, FD Receipt in the name of "The Registrar, IIT Madras" from any scheduled commercial bank or Bank Guarantee from any scheduled commercial bank in India. The performance security should be furnished within 14 days from the date of the purchase order.
	Performance Security in the form of Bank Guarantee: - In case the successful bidder wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed directly to IIT Madras from the Bank.
	The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.
11)	For the same tender, either the OEM or the authorized dealer/service provider can only quote. But both of them cannot quote separately for the same tender.
12)	The offers/bids should be sent only for a item/Equipments of latest version that is available in the market and supplied to a number of customers. A list of customers in India with details must accompany the quotations. Quotations for a prototype machine will not be accepted
13)	Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid.
14)	Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal/OEM.
15)	**Risk Purchase Clause**
	In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
16)	**Payment:**
	(i) No Advance payment will be made. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved.
	(ii) Advance Payment: No advance payment is generally admissible. In case a specific percentage of advance payment is required, the Vendor has to submit a Bank Guarantee from a scheduled commercial bank in India equivalent to the amount of advance payment.
17)	**On-site Installation:**
	The equipment/item or Machinery has to be installed or commissioned by the successful bidder within the number of days (as prescribed by PI) from the date of receipt of the item at the site of IIT Madras.
18)	**Warranty/Guarantee:**
	The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately (For more details please refer our Technical Specifications).
	** Note: PO which involves installation, warranty/guarantee shall be applicable from date of installation.
19)	**Acceptance and Rejection:**
	Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for non-compliance will likely to lead to rejection of offers.
	I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the

	quantity offered or reject it in full without assigning any reason.
20)	**Debarment from Bidding:** In case of breach of Terms & Conditions, Bidder may be suspended from being eligible for bidding in any contract with the IIT Madras up to 2 Years [as per Rule 151(iii) of GFR] from the date of Tender.

21)	**Disputes and Jurisdiction:**
	
	Settlement of Disputes: Any dispute, controversy or claim arising out of or in connection with this PO including any question regarding its existence, validity, breach or termination, shall in the first instance be attempted to be resolved amicably by both the Parties. If attempts for such amicable resolution fails or no decision is reached within 30 days whichever is earlier, then such disputes shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996. Unless the Parties agree on a sole arbitrator, within 30 days from the receipt of a written request by one Party from the other Party to so agree, the arbitral panel shall comprise of three arbitrators. In that event, the supplier will nominate one arbitrator and the Project Coordinator of IITM shall nominate on arbitrator. The Dean IC&SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceeding shall be carried out in English language. The cost of arbitration and fees of the arbitrator(s) shall be shared equally by the Parties. The seat of arbitration shall be at IC&SR IIT Madras, Chennai.
	
	    a. **The Applicable Law:** The Purchase Order shall be construed, interpreted and governed by the Laws of India. Court at Chennai shall have exclusive jurisdiction subject to the arbitration clause.
	
	    b. Any legal disputes arising out of any breach of contact pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.

22)	**Force Majeure:** The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

23)	**Eligibility Criteria:**
	
	  ❯ **As per the Government of India Order, only "Class - I Local Suppliers" and "Class - II Local Suppliers" <u>can participate in this tender.</u>**
	
	  ❯ <u>**Bidder should confirm their acceptance that they comply with the provisions with report to "Guidelines for eligibility of a bidder from a country which shares a land border with India as detailed at Annexure-E. The bidder should submit Certificate for "Bidder from/ Not from Country sharing Land border with India & Registration of Bidder with Competent Authority" as per Order of DoE F.No.6/18/2019-PPD dated 23.07.2020 as mentioned.**</u>

24)	**Preference to "class I Local Suppliers":** preference will be given to "**class 1 local suppliers**" (subject to class -I local supplier's quoted price falling within the margin of purchase preference) as per public procurement (preference to make in India) order 2017 .O.M No P- 45021/2/2017 – pp(BE - 11) dt 04/06/2020 subject to the conditions that the "class 1 Local Supplier" should agree to supply goods /

provide service at L1 rate and furnish a certificate with the technical bid document that the goods/service provided by them consists local content equal to or more than 50%.(certificate from Chartered Accountant in case value of contract exceeds Rs 10 crore).

> **'Class - I local supplier'** means a supplier or service provider whose goods, services or works offered for procurement consists of local content equal to or more than 50% as defined under the above said order. **Declaration to be provided as per Annexure-D per item/service/work.**

> **'Class - II local supplier'** means a supplier or service provider whose goods, services or works offered for procurement consists of local content equal to 20% but less than 50% as defined under the above said order. **Declaration to be provided as per Annexure-D per item/service/work.**

> **'Margin of purchase preference'**: - The margin of purchase preference shall be 20%. The Definition of the margin of purchase preference is defined in the Govt. of India Order No: **P-45021/12/2017-PP (BE-II) Dt.4th June, 2020) Order 2017. As per the Government of India Order – "Margin of Purchase Preference" means the maximum extent to which the price quoted by a "Class-I local supplier" may be above the L1 for the purpose of purchase preference.**

**Note: Local content percentage to be calculated in accordance with the definition provided at clause 2 of revised public procurement preference to Make in India Policy vide GoI Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P-45021/102/2019-BE-II-Part(1) (E-50310) Dt.4th March 2021

25)	**Evaluation of Bids** Bid evaluation will take place in two stages. **Stage I Technical Bid evaluation** All bidders who have fully complied with bidder eligibility criteria I, II and technical evaluation (Annexure A) will only be considered for opening of price bid. **Stage II: Price Bid Evaluation** The price bid evaluation will be based on price quoted by the bidder. The rate quoted for **"High Frequency Power Electronics Measurement (HFPEM)"** unit will alone be taken up for arrival of Lowest Bid (L1) value.
26)	**Selection of successful bidder and Award of Order** The order will be directly awarded to the technically qualified bidder as per the condition in para 3A of DIPP, MoCI Order No. 45021/2/2017-PP (BE II) dated 16th September 2020.
27)	All information including selection and rejection of technical or financial bids of the prospective bidders will be communicated through e-Tender portal. In terms of Rule 173(iv) of General Financial Rule 2017, the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of bids.
28)	The tenderer shall certify that the tender document submitted by him / her are of the same replica of the tender document as published by IIT Madras and no corrections, additions and alterations made to the same. If any deviation found in the same at any stage and date, the bid / contract will be rejected / terminated and actions will be initiated as per the terms and conditions of the contract.
29)	Due to Covid-19 pandemic pre-bid meeting will be conducted through online. Clarification to the queries and doubts raised by the bidders will be issued as a corrigendum/addendum in the e-tenders portal.
30)	Due to Covid-19 pandemic the bidders will not be entertained to participate in opening of Bids. Since the tender is e-tender, the opening of the bids may be checked using the respective logins of the bidders.

ACKNOWLEDGEMENT

It is hereby acknowledged that I/We have gone through all the points listed under "Specification, Guidelines, Terms and Conditions" of tender document. I/We totally understand the terms and conditions and agree to abide by the same.

SIGNATURE OF TENDERER ALONG WITH SEAL OF THE COMPANY WITH DATE

Bidder Eligibility Criteria and Technical Specification for "High Frequency Power Electronics Measurement (HFPEM)"
Tender No. PH/MSRA/124/2023/HIGHFREQEPEM

Bidder Eligibility Criteria – I (Public Procurement – Preference to Make in India)

Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE-II) dated 16th September 2020 and other subsequent orders issued therein.

Bidder Eligibility Criteria – II

1. OEM should have authorized service centre in India, functioning minimum of 10 years to provide repair, maintenance, calibration and upgradation facility (OEM should provide necessary service of operation certificate).
2. The bidder/OEM should have supplied at least 3 similar items to IITs, NITs, IISERs, CSIR Labs or other Govt.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 / IIT at its own discretion may seek opinion of the customer, based on which the vendor's offer may be accepted or rejected.
3. All 15 sub-systems must be from the same OEM for better compatibility.

III. Technical Specification For "High Frequency Power Electronics Measurement (HFPEM)"
Technical specifications for *High Frequency Power Electronics Measurement (HFPEM) system* and its sub-components (15 items) are given below.

I. EMI RECEIVER: Quantity – 1 No.

S.No	Parameter	Range
1	Requirement	Receiver for EMI/EMC full compliance measurements for Commercial (CISPR) & Military (MIL-STD-461) products
2	Frequency Range	5 Hz to > 25 GHz
3	Frequency span	0 Hz, 10 Hz to 25 GHz
4	Sweep time range Sweep point range	1 ms to 2900 s or better 1 to 500000 or more
5	Number of RF Input	2 ports minimum (RF input 1 : 3.5 mm) (RF input 2 : Type N)
6	Operating modes	EMI receiver mode and spectrum analyzer mode
7	Preamplifier	100 kHz to 25 GHz
8	Preamp Gain	+ 20 dB
9	Analysis bandwidth	10 MHz
10	Resolution Bandwidth	1 Hz to 10 MHz
11	CISPR Standard Bandwidths	200 Hz, 9 KHz, 120 kHz, 1 MHz must be available

12	MIL STD 461 compliant EMI bandwidths	10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz must be available
13	Aging Rate	$< \pm 1 \times 10{-6}$ / yr
14	DANL (Preselector / Preamp off)	≤ -118 dBm @ 1 KHz to 100 KHz ≤ -135 dBm @ 1 MHz to 25 GHz
15	DANL (Preselector /Preamp on)	≤ -118 dBm @ 1 KHz to 100 KHz ≤ -150 dBm @ 1 MHz to 25 GHz
16	Phase noise at 1 GHz @ 10 kHz offset	-113 dBc/Hz <-120 dBc/Hz
17	Trace Detectors	Normal, Peak, Sample, Negative Peak, log power average, RMS average, and voltage average, Quasi-Peak, EMI-Average, RMS-Average
18	Display Units	dBm, dBμV, dBmV, dBμA, dBmA, Watts, Volts, Amps, dBμV/m, dBμA/m, dBpT, dBG, dBpW
19	Pulse limiter	should be available built-in for conducted compliance measurements (up to max +2kW power, ≤10 us pulse width)
20	Maximum Safe Input Level	Average Power : $\geq$ +30 dBm (1 W) Peak Pulse Power : $\geq$ +40 dBm (>25 W) < 10 μs pulse width, < 1 % duty cycle and input attenuation $\geq$ 30 dB
21	Second Harmonic Distortion (RF Preselector on, Preamp off)	$\leq$+70 dBm (Typ) @1.5 GHz
22	Third Order Intermodulation (RF Preselector on, Preamp off)	$\leq$+15dBm@1.5 GHz
23	Sweep trace points for EMI Measurement	1 to 3,500,000
24	Number of Traces	>4
25	Input Attenuation Range	0 to 70 dB, in 2 dB steps
26	Measurement options	Spectrum analysis Channel Power Adjacent channel power Occupied bandwidth Harmonic distortion Spurious emission Spectrum emission mask (SEM)
27	Interface	GPIB/LAN/USB
28	Along with analyser Source control is required	External source control is required to control signal generator
29	Near field probes	Nearfield probes set operating range: 30MHz to 3 GHz

S.No	Parameter	Range
30	Future Upgradability	a. Analysis bandwidth of 160 MHz b. Noise Figure & Phase noise measurement capability c. Real-Time Analysis, up to 160 BW
31	Warranty	3 years minimum
32	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.

II. Four-port Vector Network Analyzer (VNA): Quantity: 1 No.

S.No	Parameter	Range
1	Instrument	Compact, lightweight vector network analyzer (VNA) with external monitor
2	Frequency range	100 kHz to > 42 GHz
3	Number of Ports	4 (2.4 mm female)
4	Input impedance	50 Ω
5	System dynamic range (typ)	≥ 105dB @100 KHz to 500 KHz ≥ 130dB @ 500 KHz to 10 MHz ≥ 140dB @ 10 MHz to 26 GHz ≥ 132dB @ 26 GHz to 44 GHz
6	Test port noise floor	≥ 105dBm @100 KHz to 500 KHz ≥ 120dBm @ 500 KHz to 10 MHz ≥ 130dBm @ 10 MHz to 25 GHz ≥ 126dBm @ 25 GHz to 44 GHz
7	Trace noise magnitude (typ)	≤ 0.0021 dB rms
	Trace noise phase (typ)	≤ 0.0059 deg rms
8	Frequency resolution	1Hz
9	Frequency accuracy	± 7 ppm
10	IFBW	1 Hz to 15 MHz
11	No of Measurement Points	1 to >100000
12	2nd and 3rd Harmonics at 0 dBm	≤-15 dBc typical
13	Sub-harmonic at nominal power	≤-20 dBc typical
14	Power resolution	0.01 dB
15	Maximum settable power	+20 dBm
16	Minimum settable power	-100 dBm
17	Measurement Range	DANL to maximum input level
18	Maximum Safe Input Level	+27 dBm
19	Measurements Mode	Frequency domain (Full 4Port S-parameter measurements) Enhanced Time domain Measurements Pulsed RF measurements
20	Minimum pulse	200 nsec

		width
21	Pulse period	Minimum: 1 usec Maximum: 10 sec
22	TDR impulse width	<14 ps
23	TDR stimulus	Step, Impulse
24	Accessories	4 Nos RF cables 1 No Electronic calibration Kit
25	AC input Power	220 V±10%, 50 Hz
26	Operating Temperature	0 to 50 °C ambient
27	Physical size and weight	Width : 176 mm (6.93 in.) Height : 68 mm (2.68 in.) Depth : 333 mm (13.11 in.) Weight : 3.18 kg (7.01 lbs)
28	Warranty	3 years minimum
29	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.

III. Digital Storage Oscilloscope >32 GHz, 4-channels: Quantity: 1 No.

Sl No	Parameter	Specification
1	Analog Bandwidth - 3dB(typical)	>32 GHz with 2 channels >15 Ghz with 4 channels
2	Analog channels	4 minimum
3	Max Sampling Rate	Minimum 80 GSa/s @ 2 ch 40 GSa/s @ 4 ch
4	Standard Memory	1 Gpts /Channel
5	Maximum waveform update rate	> 400,000 waveforms per second
6	ADC / Vertical Resolution	8 bits minimum without averaging, ≥ 12 bits with averaging
7	ENOB (50mV/div)	<7 bits at 16GHz
8	Input impedance	50 Ω
9	Input sensitivity range	1 mV/div to 1 V/div
10	Rms Noise with 5mV/div	0.58 mV rms @ 33GHz
11	Time Base range	2 ps/div to 50 s/div min
12	Time base accuracy	0.1ppm or better
13	Rise Time (10-90%)	<15ps or better
14	Intrinsic jitter	100fs rms
15	Segmented Memory	Should have capability of Capturing min >130k segments at maximum memory
16	Acquisition Mode	Realtime, Averaging, Peak detect, Hi Resolution, Roll mode, Segmented
17	Waveform Processing/Math	Should be available

18	Measurements	Voltage (analog): V peak-peak, V min, V max, V upper, V middle, V lower, V overshoot, V preshoot, V time, peak-peak contrast, average, RMS, amplitude, base, top, overshoot, preshoot, crossing, pulse top, pulse base, pulse amplitude Time (analog): Rise time, fall time, period, frequency, positive width, negative width, duty cycle, Tmin, Tmax, Tvolt, channel-to-channel delta time, channel-to-channel phase, count pulses, burst width, burst period, burst interval, setup time, hold time, edge-edge, edge time, slew rate Frequency domain (analog): FFT frequency, FFT magnitude, FFT delta frequency, FFT delta magnitude, FFT channel power, FFT power spectral density, FFT occupied bandwidth, peak detect mode Eye (analog): Eye height, eye width, eye one level, eye zero level, eye jitter, eye skew, eye level, crossing percentage, Q factor, duty-cycle distortion
19	Jitter Analysis Measurements	Clock - Time interval error, N-period, period to period, positive width to positive width, neg width to neg width, duty cycle to duty cycle. Data - Time interval error, noise, unit interval, N Unit Interval, unit interval to unit interval, data rate, clock recovery rate, CDR, de-emphasis Phase noise - Phase jitter
20	Accessories	- Performance verification and deskew fixture - High Impedance Adapter for Oscilloscopes (SMA to BNC)
21	I/O ports	LAN, USB, AUX out, CAL out, Trigger Out, GPIB, Aux trigger
22	Computer system and peripherals	Windows 10 or 11 with removable 1 TB SSD memory
23	Warranty	3 Years minimum
24	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.
25	Probes and accessories	Standard probes and accessories to be included.

IV. Digital Storage Oscilloscope ≥ 1GHz, 8-channels: Quantity: 1 No.

Sl No	Parameter	Specification
1	Number of Channels	8 Analog Channels
2	Analog Bandwidth (-3dB) Per Ch	≥ 1GHz on all Eight channels simultaneously
3	Sampling Rate (Real Time) Per Ch	≥ 16 GS/s on all Eight channels simultaneously
4	Memory (Record Length) per Ch simultaneously	≥ 400 Mpts/Ch on all Eight channels simultaneous
5	Real-time update rate	min >200,000 waveforms/sec
6	Input Impedance	50 Ω, 1 MΩ
7	Maximum Input Voltage	±5 Vmax at 50Ohm & 30 VRMS or ±40 VMAX (DC +Vpp) at 1M ohm
8	ADC Resolution	10bit of resolution up till 16GS/s up to full bandwidth 1 GHz
9	ENOB on 50 Ω inputs, 50 mV/div	8.0 @1 GHz

10	Time Base Range	≤ 5 ps/division to >50s/division
11	Input sensitivity (Vertical) Range	≤1mV/division to 3V/division at 1MΩ
		≤1mV/division to ≥1V/division at 50Ω
12	Acquisition Modes	Sample, Averaging, Peak detect, Segmented, Roll mode
13	Trigger Types	Edge (Rising, Falling, Voltage level on any channel or auxiliary trigger), Glitch, Pulse width, Runt, Patter/state, Burst.
14	Waveform Measurements	Amplitude, average, base, crossing point, maximum, minimum, overshoot and preshoot (as a percentage or voltage), VPP contrast, peak to peak, pulse (amplitude, base, top), RMS, top, thresholds (lower, middle, upper),voltage @ time, Rise time, fall time, period, frequency, pulse width (+/-), duty cycle, TMIN, TMAX, crossing point time, delta time, pulse count, bursts (width, period, interval), s/h time, FFT frequency and magnitude, channel power, power spectral density, occupied bandwidth
15	Power Supply Test Software	The oscilloscope should be able to measure broad range of automated power supply characterization measurements including critical frequency response measurements.
16	Input Probes	8 passive probes should be supplied of 1 GHz bandwidth
17	Display	Capacitive touch screen with minimum 15 inch display size preferred
18	Operating System	Windows 10 or 11
19	CPU	Intel Core i5-6500, 3.2 GHz or better
20	System memory	8 GB
21	Hard drives	Removeable min 500 GB SSD
22	Power	100V–240V @ 50Hz
23	Warranty	3 years minimum
24	Accessories	Mouse and Keyboard
25	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.

V. High voltage probe (100:1): Quantity – 2 Nos.

Sl No	Parameter and Specification
1	Bandwidth (-3 dB): 500 MHz
2	Risetime (calculated): <1 ns
3	Attenuation ratio: 100:1
4	Input resistance: > 50 M Ω (when terminated into 1 M Ω) / Input capacitance: <4 pF (approximate)
5	Compensation range: 6-18 pF
6	Maximum input: 3,700 Vpk, 2,650 Vrms, 2,650Vdc (mains isolated)
7	1,000 Vpk (dc + peak ac) CAT II
8	Length: 1.8 m
9	Probe ID: Yes

VI. High voltage differential probe: Quantity – 4 Nos.

Sl No	Parameter and Specification
1	400 MHz bandwidth
2	2,000 Vrms mains isolated, 6,000 V transient overvoltage
3	Attenuation ratios: 50:1, 100:1, 250:1 or 500:1, auto switchable on scope

4	Differential input impedance: 10 MΩ ǁ 2pF
5	High CMRR simplifies the measurement challenges found in noisy, high common-mode power electronics environments.
6	UL safety certified
7	Need additional accessories
8	Interface, 50 Ω input

VII. High sensitivity Clamp-On AC/DC current probe: Quantity – 2 Nos.

Sl No	Parameter and Specification
1	Wide bandwidth: DC to 150 MHz
2	High sensitivity: down to 1 mA/div without filter
3	Lower current measurement capability with high signal to noise ratio
4	With external AC adapter: 40 Apeak non-continuous, 30 ADC, 30 Arms continuous
5	Without external AC adapter: 15 Apeak non-continuous, 5 ADC, 5 Arms continuous
6	Demagnetization (degauss) and offset calibration button on probe for easy access

VIII. Rogowski AC Current probe: Quantity – 1 No.

Sl No	Parameter and Specification
1	peak current: 600 Apeak
2	easy-to-use, flexible probe tip loop
3	coil length: 100 mm
4	coil cross-section (diameter): 4.5 mm min
5	bandwidth: 12 Hz to 30 MHz
6	cable length: 2.5 m
7	powered by battery pack or AC adapter (included)

IX. AC/DC current probe (10 MHz, 150 A): Quantity – 2 Nos.

Sl No	Parameter and Specification
1	Superior 1% accuracy and high signal-to-noise ratio
2	Direct connection to high- impedance 1 MΩ BNC input of oscilloscope
3	Overload-protect function prevents probe damage from excessive input
4	Demagnetize" button to remove any residual magnetism
5	3-channel power supply for current probes DC ±12 V ±1 V
6	Risetime 35 ns or less
7	Output voltage rate 0.01 V/A (100:1)
8	Noise 25 mArms or less
9	Diameter of measurable conductors >15 mm and < 20mm

X. Digital Storage Oscilloscope, 500 MHz, 4 Channel: Quantity: 3 Nos.

Sl No	Parameter	Specification
1	Number of Channels	4 Analog Channels

2	Analog Bandwidth (-3dB) Per Ch	≥ 500 MHz on all Four channels simultaneously
3	Sampling Rate (Real Time) Per Ch	15 GS/s on all Four channels simultaneously
4	Memory (Record Length) per Ch simultaneously	350 Mpts/Ch on all Four channels simultaneous
6	Real-time update rate	min >180,000 waveforms/sec
7	Input Impedance	50 Ω, 1 MΩ
8	Absolute Maximum Input Voltage	±5 Vmax at 50Ohm and 30 Vrms or ±40 VMAX (DC +Vpp)
9	ADC Resolution	10bit of resolution up till 16GS/s up to full bandwidth 500 MHz
10	ENOB on 50 Ω inputs, 50 mV/div	<9 at Frequency 500 MHz
11	Time Base Range	≤ 5 ps/division to ≥200s/division
12	Input sensitivity (Vertical) Range	≤1mV/division to ≥5V/division at 1MΩ
		≤1mV/division to ≥1V/division at 50Ω
13	Acquisition Modes	Sample, Averaging, Peak detect, Segmented, Roll mode
14	Trigger Types	Edge (Rising, Falling, Voltage level on any channel or auxiliary trigger), Glitch, Pulse width, Runt, Patter/state, Burst
15	Waveform Measurements	Amplitude, average, base, crossing point, maximum, minimum, overshoot and preshoot (as a percentage or voltage), VPP contrast, peak to peak, pulse (amplitude, base, top), RMS, top, thresholds (lower, middle, upper),voltage @ time, Rise time, fall time, period, frequency, pulse width (+/-), duty cycle, TMIN, TMAX, crossing point time, delta time, pulse count, bursts (width, period, interval), s/h time, FFT frequency and magnitude, channel power, power spectral density, occupied bandwidth
16	Input Probes	4 passive probes should be supplied of 500MHz bandwidth
17	Display	Capacitive touch screen with minimum 15-inch display size
18	Operating System	Windows 10
19	CPU	Intel Core i5-6500, 3.2 GHz
20	System memory	> 7 GB
21	Hard drives	Removeable min 500 GB SSD
22	Power	100V–240V @ 50Hz
23	Warranty	3 years minimum
24	Accessories	Mouse and Keyboard
25	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.

XI. Dual input Electronic Load (600 W): Quantity: 2 Nos.

Sl. No	Parameter	Range
1	Dual-input DC electronic load:	150V, 60A, 300W
2.	Maximum Input Power	600W
3.	Parallel mode	120A
4.	Programming and Read back Accuracy.	
	Constant current mode	0.04% + 130 µA

	Constant voltage mode	0.02% + 3 mV
	Constant resistance mode	0.1% + 230 mS
	Constant power mode	0.06% + 4 mW
5.	Operating modes:	constant current (CC), constant voltage (CV), constant resistance (CR), constant power (CP)
6.	Min sample rate	20 microseconds for datalogging
7.	Slew Rates for min CC mode	40 A/ms, >75 V/ms
8.	Programming Resolution min CC mode	<10 µA in CC, <200 µV in CV, <0.1 µV in Cp
9.	DC electronic loads are fully SCPI programmable with built-in USB, LAN, and optional GPIB interfaces.	
10	Protection	OCP, OVP & OPP
11	Fully integrated voltmeter and ammeter to simultaneously measure the voltage and current for the DUT.	
12	Digital I/O for Fault, Int, Trigger in/out	
13	Remote sense technology should have 4 wire to eliminate voltage drops.	
14	Continuously Data log voltage, current and energy parameters	
15	Measurement data can save externally on a USB memory device as a .CSV file	
16	Need to perform precise transient analysis with a scope function.	
17	Displays results on a 4.3-inch color LCD screen.	
18	Dynamic load profiles with List (continuous, pulse, or toggle)	
19	Software for the PC or a soft front panel via a web interface allows uses to operate the electronic load remotely, execute test sequences, log data, and integrate with other test instruments.	
20.	Weight max <10Kg	
21.	Input power 100 VAC to 240 VAC (±10%), 50/60Hz	
22.	Safety UL 61010-1 3rd edition, CAN/CSA-C22.2 No. 61010-1-12, IEC 61010-1:2010 3rd edition.	
23	Warranty: 3 Years minimum	

XII. Digital Multimeter (6 1/2-digit): Quantity: 4 Nos.

Sl No	Parameter	Specification
1	Digits of Resolution	6 ½ Digit
2	DC accuracy	Better than 30 ppm
3	Max reading rate	Better than 40,000 rdgs/s
4	Memory	Greater than 45,000 rdgs
5	DC voltage range	100mv ≥ 1000 V or larger
6	AC voltage (RMS range)	200 mv ≥ 750V or larger
7	Current rating (DC and AC)	1uA dc to 10A
8	2- and 4- wire resistance	100 Ohm and 1000 M ohm
9	Capacitance	1nf to 100uF
10	Frequency	3 Hz to 300 kHz
11	Temperature	RTD/PT100, Thermistor,
		K, J, T, E & N type Thermocouples
12	Display	Color graphics
		Histogram, bar chart, Trend
13	USB, USB host	Yes

14	LAN/LXI	Yes
15	Basic 1-Year DCV Accuracy	<0.01%
16	Features	Provides a data logging mode for easier trend analysis and a digitizing mode for capturing transients
17	Measurement functions	DCV and ACV
		DCI and ACI
		2- and 4-wire Resistance
		Frequency
		Capacitance
		Diode test
		Continuity test
		Temperature
18	Compactable drivers	LabVIEW & MATLAB
19	Test leads	Test lead probes with retractable sheath (2 units)
		Fine tip probes (2 units)
		SMT Grabbers (2 units)
		Mini Grabber (1 Unit)
20	Warranty	3 Years minimum

XIII. Data Acquisition System: Quantity: 2 Nos.

The LXI Compliant 60 Channel Data Acquisition System should be a modular system to record parameters like Voltage, Current, strain, Capacitance, Temperature & Pressure.
The system should be configurable as a Data Logger, Data Acquisition System and High-Performance Switching Unit. It should be capable of working Stand Alone or be controlled from a Controller.
MEASUREMENTS
a) DC Volts up to 300V with <150nV resolution and <0.0045% basic DC V accuracy
b) 6 1/2 Digits with 22-bit resolution
c) Input Impedance > 10 GOhm in 100mV, 1V & 10V range
d) AC Volts True RMS up to 300V with 300 KHz
e) 2 & 4 Wire Resistance Measurement
f) Resistance 100 Ohms to 1000 MOhms
g) Frequency & Period up to 300 KHz
h) Temperature Measurement with RTD, Thermistor 2.2 & 10kohms & Thermocouple (B, E, J, K, N, R, S, T)
i) DC & AC Current 1uA range to 1A directly
j) Measures and converts 12 different input signals: Temperature with thermocouples, RTDs and thermistors, DC/AC volts, 2- and 4-wire resistance, frequency and period, DC/ AC current and capacitance 1nF to 10uF, Diode test 5V & Strain measurement
k) LCD Display
l) Calibration certificates traceable to National / International standards
SYSTEM CHARECTERISTICS:
a) System Speed - >100rdgs/sec
b) Scanning Inputs - Analog & Digital
c) Scan Triggering - Int, Ext, Manual, Software, on Ch Alarm
d) Scan Count - 1 to 50,000 or continuous

e)	Scan Interval - 0 to 99 hours, 1ms step size
f)	Alarms - Hi, Lo with 4 TTL Compatible Alarm Outputs
g)	Memory – 1Million points with time stamp & real time clock
h)	Maths - Scaling (Mx + B) & Min/Max/Avg
i)	Relay Maintenance - Should count each relay closure.
j)	Should come with powerful plug & play Logger software
k)	Upgrade modules & main frame
l)	Computer Interface USB, LAN/LXI & USB Host Port

Warranty	3 Years minimum

XIV. Sixteen Channel Digital multiplexer: Quantity: 6 Nos.

1	No of Channels: 16 Channels
2	Scan Speed: Scanning up to 250 ch/s
3	Offset Voltage: <6μV
4	Bandwidth: 10MHz
5	Built-in thermocouple reference junction
6	Max Input: 300V AC & DC isolated input
7	Configuration: 2 wire or 4 wire - user selectable
8	Warranty minimum 3 years
9	Sixteen channel digital multiplexer should be compatible with Data acquisition system mention in item no. XIII.

XV. Twenty Channel solid state multiplexer: Quantity: 6 Nos.

1	No of Channels: 20 Channels
2	Scan Speed: Scanning up to minimum 450 ch/s
3	Offset Voltage: <6μV
4	Bandwidth: 10MHz
5	Built-in thermocouple reference junction
6	Max Input: >100V isolated input
7	Configuration: 2 wire or 4 wire - user selectable
8	Warranty minimum 3 years
9	Twenty channel solid state multiplexer should be compatible with Data acquisition system mention in item no. XIII.

TECHNICAL BID PROFORMA
Tender No. PH/MSRA/124/2023/HIGHFREQEPEM
Item Name: "High Frequency Power Electronics Measurement (HFPEM)"

Bidder Eligibility Criteria:

1.0	Bidder Eligibility Criteria-I (Public Procurement – Preference to Make in India)	Class I / Class II	Local Content value	Reference, Page No.
I	Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16th September 2020 and other subsequent orders issued therein.			
2.0	**Bidder Eligibility Criteria-I**	**Complied /Not Complied**		**Ref.Pg.No**
1.	OEM should have authorized service centre in India, functioning minimum of 10 years to provide repair, maintenance, calibration and upgradation facility (OEM should provide necessary service of operation certificate).			
2.	The bidder/OEM should have supplied at least 3 similar items to IITs, NITs, IISERs, CSIR Labs or other Govt. 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 / IIT at its own discretion may seek opinion of the customer, based on which the vendor's offer may be accepted or rejected.			
3.	All 15 sub-systems must be from the same OEM for better compatibility.			

3.0 Technical Compliance:

I. EMI RECEIVER: Quantity – 1 No.

S.No	Parameter	Range	Complied /Not Complied	Ref.Pg.No
1	Requirement	Receiver for EMI/EMC full compliance measurements for Commercial (CISPR) & Military (MIL-STD-461) products		
2	Frequency Range	5 Hz to > 25 GHz		
3	Frequency span	0 Hz, 10 Hz to 25 GHz		
4	Sweep time range Sweep point range	1 ms to 2900 s or better 1 to 500000 or more		
5	Number of RF Input	2 ports minimum (RF input 1 : 3.5 mm) (RF input 2 : Type N)		
6	Operating modes	EMI receiver mode and spectrum analyzer mode		
7	Preamplifier	100 kHz to 25 GHz		
8	Preamp Gain	+ 20 dB		
9	Analysis bandwidth	10 MHz		
10	Resolution Bandwidth	1 Hz to 10 MHz		
11	CISPR Standard Bandwidths	200 Hz, 9 KHz, 120 kHz, 1 MHz must be available		
12	MIL STD 461 compliant EMI bandwidths	10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz must be available		
13	Aging Rate	$< \pm 1 \times 10^{-6}$ / yr		
14	DANL (Preselector / Preamp off)	≤ -118 dBm @ 1 KHz to 100 KHz ≤ -135 dBm @ 1 MHz to 25 GHz		
15	DANL (Preselector /Preamp on)	≤ -118 dBm @ 1 KHz to 100 KHz ≤ -150 dBm @ 1 MHz to 25 GHz		
16	Phase noise at 1 GHz @ 10 kHz offset	-113 dBc/Hz <-120 dBc/Hz		
17	Trace Detectors	Normal, Peak, Sample, Negative Peak, log power average, RMS average, and voltage average, Quasi-Peak, EMI-Average, RMS-Average		
18	Display Units	dBm, dBµV, dBmV, dBµA, dBmA, Watts, Volts, Amps, dBµV/m, dBµA/m, dBpT, dBG, dBpW		
19	Pulse limiter	should be available built-in for conducted compliance measurements (up to max +2kW power, $\leq$10 us pulse width)		

S.No	Parameter	Range	Complied/Not Complied	Ref.Pg.No
20	Maximum Safe Input Level	Average Power : $\geq$ +30 dBm (1 W) Peak Pulse Power : $\geq$ +40 dBm (>25 W) < 10 µs pulse width, < 1 % duty cycle and input attenuation $\geq$ 30 dB		
21	Second Harmonic Distortion (RF Preselector on, Preamp off)	$\leq$+70 dBm (Typ) @1.5 GHz		
22	Third Order Intermodulation (RF Preselector on, Preamp off)	$\leq$+15dBm@1.5 GHz		
23	Sweep trace points for EMI Measurement	1 to 3,500,000		
24	Number of Traces	>4		
25	Input Attenuation Range	0 to 70 dB, in 2 dB steps		
26	Measurement options	Spectrum analysis Channel Power Adjacent channel power Occupied bandwidth Harmonic distortion Spurious emission Spectrum emission mask (SEM)		
27	Interface	GPIB/LAN/USB		
28	Along with analyser Source control is required	External source control is required to control signal generator		
29	Near field probes	Nearfield probes set operating range: 30MHz to 3 GHz		
30	Future Upgradability	a. Analysis bandwidth of 160 MHz b. Noise Figure & Phase noise measurement capability c. Real-Time Analysis, up to 160 BW		
31	Warranty	3 years minimum		
32	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.		

II. Four-port Vector Network Analyzer (VNA): Quantity: 1 No.

S.No	Parameter	Range	Complied/Not Complied	Ref.Pg.No
1	Instrument	Compact, lightweight vector network analyzer (VNA) with external monitor		

2	Frequency range	100 kHz to > 42 GHz		
3	Number of Ports	4 (2.4 mm female)		
4	Input impedance	50 Ω		
5	System dynamic range (typ)	≥ 105dB @100 KHz to 500 KHz ≥ 130dB @ 500 KHz to 10 MHz ≥ 140dB @ 10 MHz to 26 GHz ≥ 132dB @ 26 GHz to 44 GHz		
6	Test port noise floor	≥ 105dBm @100 KHz to 500 KHz ≥ 120dBm @ 500 KHz to 10 MHz ≥ 130dBm @ 10 MHz to 25 GHz ≥ 126dBm @ 25 GHz to 44 GHz		
7	Trace noise magnitude (typ)	≤ 0.0021 dB rms		
	Trace noise phase (typ)	≤ 0.0059 deg rms		
8	Frequency resolution	1Hz		
9	Frequency accuracy	± 7 ppm		
10	IFBW	1 Hz to 15 MHz		
11	No of Measurement Points	1 to >100000		
12	2nd and 3rd Harmonics at 0 dBm	≤-15 dBc typical		
13	Sub-harmonic at nominal power	≤-20 dBc typical		
14	Power resolution	0.01 dB		
15	Maximum settable power	+20 dBm		
16	Minimum settable power	-100 dBm		
17	Measurement Range	DANL to maximum input level		
18	Maximum Safe Input Level	+27 dBm		
19	Measurements Mode	Frequency domain (Full 4Port S-parameter measurements) Enhanced Time domain Measurements Pulsed RF measurements		
20	Minimum pulse width	200 nsec		
21	Pulse period	Minimum: 1 usec Maximum: 10 sec		
22	TDR impulse width	<14 ps		
23	TDR stimulus	Step, Impulse		
24	Accessories	4 Nos RF cables 1 No Electronic calibration Kit		
25	AC input Power	220 V±10%, 50 Hz		
26	Operating Temperature	0 to 50 °C ambient		

Sl No	Parameter	Specification	Complied /Not Complied	Ref.Pg.No
27	Physical size and weight	Width : 176 mm (6.93 in.) Height : 68 mm (2.68 in.) Depth : 333 mm (13.11 in.) Weight : 3.18 kg (7.01 lbs)		
28	Warranty	3 years minimum		
29	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.		

III. Digital Storage Oscilloscope >32 GHz, 4-channels: Quantity: 1 No.

Sl No	Parameter	Specification	Complied /Not Complied	Ref.Pg.No
1	Analog Bandwidth - 3dB(typical)	>32 GHz with 2 channels >15 Ghz with 4 channels		
2	Analog channels	4 minimum		
3	Max Sampling Rate	Minimum 80 GSa/s @ 2 ch 40 GSa/s @ 4 ch		
4	Standard Memory	1 Gpts /Channel		
5	Maximum waveform update rate	> 400,000 waveforms per second		
6	ADC / Vertical Resolution	8 bits minimum without averaging, $\geq$ 12 bits with averaging		
7	ENOB (50mV/div)	<7 bits at 16GHz		
8	Input impedance	50 Ω		
9	Input sensitivity range	1 mV/div to 1 V/div		
10	Rms Noise with 5mV/div	0.58 mV rms @ 33GHz		
11	Time Base range	2 ps/div to 50 s/div min		
12	Time base accuracy	0.1ppm or better		
13	Rise Time (10-90%)	<15ps or better		
14	Intrinsic jitter	100fs rms		
15	Segmented Memory	Should have capability of Capturing min >130k segments at maximum memory		
16	Acquisition Mode	Realtime, Averaging, Peak detect, Hi Resolution, Roll mode, Segmented		
17	Waveform Processing/Math	Should be available		
18	Measurements	Voltage (analog): V peak-peak, V min, V max, V upper, V middle, V lower, V overshoot, V preshoot, V time, peak-peak contrast, average, RMS, amplitude, base, top, overshoot, preshoot, crossing, pulse top, pulse base, pulse amplitude Time (analog): Rise time, fall time, period, frequency, positive width, negative width, duty cycle, Tmin, Tmax, Tvolt, channel-to-channel delta time, channel-to-channel phase, count pulses, burst width,		

Sl No	Parameter	Specification	Complied /Not Complied	Ref.Pg.No
		burst period, burst interval, setup time, hold time, edge-edge, edge time, slew rate Frequency domain (analog): FFT frequency, FFT magnitude, FFT delta frequency, FFT delta magnitude, FFT channel power, FFT power spectral density, FFT occupied bandwidth, peak detect mode Eye (analog): Eye height, eye width, eye one level, eye zero level, eye jitter, eye skew, eye level, crossing percentage, Q factor, duty-cycle distortion		
19	Jitter Analysis Measurements	Clock - Time interval error, N-period, period to period, positive width to positive width, neg width to neg width, duty cycle to duty cycle. Data - Time interval error, noise, unit interval, N Unit Interval, unit interval to unit interval, data rate, clock recovery rate, CDR, de-emphasis Phase noise - Phase jitter		
20	Accessories	- Performance verification and deskew fixture - High Impedance Adapter for Oscilloscopes (SMA to BNC)		
21	I/O ports	LAN, USB, AUX out, CAL out, Trigger Out, GPIB, Aux trigger		
22	Computer system and peripherals	Windows 10 or 11 with removable 1 TB SSD memory		
23	Warranty	3 Years minimum		
24	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.		
25	Probes and accessories	Standard probes and accessories to be included.		

IV. Digital Storage Oscilloscope ≥ 1GHz, 8-channels: Quantity: 1 No.

Sl No	Parameter	Specification	Complied /Not Complied	Ref.Pg.No
1	Number of Channels	8 Analog Channels		
2	Analog Bandwidth (-3dB) Per Ch	≥ 1GHz on all Eight channels simultaneously		
3	Sampling Rate (Real Time) Per Ch	≥ 16 GS/s on all Eight channels simultaneously		
4	Memory (Record Length) per Ch simultaneously	≥ 400 Mpts/Ch on all Eight channels simultaneous		
5	Real-time update rate	min >200,000 waveforms/sec		
6	Input Impedance	50 Ω, 1 MΩ		

7	Maximum Input Voltage	±5 Vmax at 50Ohm & 30 VRMS or ±40 VMAX (DC +Vpp) at 1M ohm		
8	ADC Resolution	10bit of resolution up till 16GS/s up to full bandwidth 1 GHz		
9	ENOB on 50 Ω inputs, 50 mV/div	8.0 @1 GHz		
10	Time Base Range	≤ 5 ps/division to >50s/division		
11	Input sensitivity (Vertical) Range	≤1mV/division to 3V/division at 1MΩ		
		≤1mV/division to ≥1V/division at 50Ω		
12	Acquisition Modes	Sample, Averaging, Peak detect, Segmented, Roll mode		
13	Trigger Types	Edge (Rising, Falling, Voltage level on any channel or auxiliary trigger), Glitch, Pulse width, Runt, Patter/state, Burst.		
14	Waveform Measurements	Amplitude, average, base, crossing point, maximum, minimum, overshoot and preshoot (as a percentage or voltage), VPP contrast, peak to peak, pulse (amplitude, base, top), RMS, top, thresholds (lower, middle, upper),voltage @ time, Rise time, fall time, period, frequency, pulse width (+/-), duty cycle, TMIN, TMAX, crossing point time, delta time, pulse count, bursts (width, period, interval), s/h time, FFT frequency and magnitude, channel power, power spectral density, occupied bandwidth		
15	Power Supply Test Software	The oscilloscope should be able to measure broad range of automated power supply characterization measurements including critical frequency response measurements.		
16	Input Probes	8 passive probes should be supplied of 1 GHz bandwidth		
17	Display	Capacitive touch screen with minimum 15 inch display size preferred		
18	Operating System	Windows 10 or 11		
19	CPU	Intel Core i5-6500, 3.2 GHz or better		
20	System memory	8 GB		
21	Hard drives	Removeable min 500 GB SSD		
22	Power	100V–240V @ 50Hz		
23	Warranty	3 years minimum		
24	Accessories	Mouse and Keyboard		
25	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.		

V. High voltage probe (100:1): Quantity – 2 Nos.

Sl No	Parameter and Specification	Complied /Not Complied	Ref.Pg.No
1	Bandwidth (-3 dB): 500 MHz		
2	Risetime (calculated): <1 ns		
3	Attenuation ratio: 100:1		
4	Input resistance: > 50 M Ω (when terminated into 1 M Ω) / Input capacitance: <4 pF (approximate)		
5	Compensation range: 6-18 pF		
6	Maximum input: 3,700 Vpk, 2,650 Vrms, 2,650Vdc (mains isolated)		
7	1,000 Vpk (dc + peak ac) CAT II		
8	Length: 1.8 m		
9	Probe ID: Yes		

VI. High voltage differential probe: Quantity – 4 Nos.

Sl No	Parameter and Specification	Complied /Not Complied	Ref.Pg.No
1	400 MHz bandwidth		
2	2,000 Vrms mains isolated, 6,000 V transient overvoltage		
3	Attenuation ratios: 50:1, 100:1, 250:1 or 500:1, auto switchable on scope		
4	Differential input impedance: 10 MΩ || 2pF		
5	High CMRR simplifies the measurement challenges found in noisy, high common-mode power electronics environments.		
6	UL safety certified		
7	Need additional accessories		
8	Interface, 50 Ω input		

VII. High sensitivity Clamp-On AC/DC current probe: Quantity – 2 Nos.

Sl No	Parameter and Specification	Complied /Not Complied	Ref.Pg.No
1	Wide bandwidth: DC to 150 MHz		
2	High sensitivity: down to 1 mA/div without filter		
3	Lower current measurement capability with high signal to noise ratio		
4	With external AC adapter: 40 Apeak non-continuous, 30 ADC, 30 Arms continuous		
5	Without external AC adapter: 15 Apeak non-continuous, 5 ADC, 5 Arms continuous		
6	Demagnetization (degauss) and offset calibration button on probe for easy access		

VIII. Rogowski AC Current probe: Quantity – 1 No.

Sl No	Parameter and Specification	Complied /Not Complied	Ref.Pg.No
1	peak current: 600 Apeak		
2	easy-to-use, flexible probe tip loop		
3	coil length: 100 mm		
4	coil cross-section (diameter): 4.5 mm min		
5	bandwidth: 12 Hz to 30 MHz		
6	cable length: 2.5 m		
7	powered by battery pack or AC adapter (included)		

IX. AC/DC current probe (10 MHz, 150 A): Quantity – 2 Nos.

Sl No	Parameter and Specification	Complied /Not Complied	Ref.Pg.No
1	Superior 1% accuracy and high signal-to-noise ratio		
2	Direct connection to high- impedance 1 MΩ BNC input of oscilloscope		
3	Overload-protect function prevents probe damage from excessive input		
4	Demagnetize" button to remove any residual magnetism		
5	3-channel power supply for current probes DC ±12 V ±1 V		
6	Risetime 35 ns or less		
7	Output voltage rate 0.01 V/A (100:1)		
8	Noise 25 mArms or less		
9	Diameter of measurable conductors >15 mm and < 20mm		

X. Digital Storage Oscilloscope, 500 MHz, 4 Channel: Quantity: 3 Nos.

Sl No	Parameter	Specification	Complied /Not Complied	Ref.Pg.No
1	Number of Channels	4 Analog Channels		
2	Analog Bandwidth (-3dB) Per Ch	≥ 500 MHz on all Four channels simultaneously		
3	Sampling Rate (Real Time) Per Ch	15 GS/s on all Four channels simultaneously		
4	Memory (Record Length) per Ch simultaneously	350 Mpts/Ch on all Four channels simultaneous		
6	Real-time update rate	min >180,000 waveforms/sec		
7	Input Impedance	50 Ω, 1 MΩ		
8	Absolute Maximum Input Voltage	±5 Vmax at 50Ohm and 30 Vrms or ±40 VMAX (DC +Vpp)		
9	ADC Resolution	10bit of resolution up till 16GS/s up to full bandwidth 500 MHz		
10	ENOB on 50 Ω inputs, 50 mV/div	<9 at Frequency 500 MHz		
11	Time Base Range	≤ 5 ps/division to ≥200s/division		
12	Input sensitivity (Vertical) Range	≤1mV/division to ≥5V/division at 1MΩ		

		≤1mV/division to ≥1V/division at 50Ω		
13	Acquisition Modes	Sample, Averaging, Peak detect, Segmented, Roll mode		
14	Trigger Types	Edge (Rising, Falling, Voltage level on any channel or auxiliary trigger), Glitch, Pulse width, Runt, Patter/state, Burst		
15	Waveform Measurements	Amplitude, average, base, crossing point, maximum, minimum, overshoot and preshoot (as a percentage or voltage), VPP contrast, peak to peak, pulse (amplitude, base, top), RMS, top, thresholds (lower, middle, upper),voltage @ time, Rise time, fall time, period, frequency, pulse width (+/-), duty cycle, TMIN, TMAX, crossing point time, delta time, pulse count, bursts (width, period, interval), s/h time, FFT frequency and magnitude, channel power, power spectral density, occupied bandwidth		
16	Input Probes	4 passive probes should be supplied of 500MHz bandwidth		
17	Display	Capacitive touch screen with minimum 15-inch display size		
18	Operating System	Windows 10		
19	CPU	Intel Core i5-6500, 3.2 GHz		
20	System memory	> 7 GB		
21	Hard drives	Removeable min 500 GB SSD		
22	Power	100V–240V @ 50Hz		
23	Warranty	3 years minimum		
24	Accessories	Mouse and Keyboard		
25	Demonstration	Installation and demonstration of all features to the satisfaction of the end user to be done.		

XI. Dual input Electronic Load (600 W): Quantity: 2 Nos.

Sl. No	Parameter	Range	Complied /Not Complied	Ref.Pg.No
1	Dual-input DC electronic load:	150V, 60A, 300W		
2.	Maximum Input Power	600W		
3.	Parallel mode	120A		
4.	Programming and Read back Accuracy.			
	Constant current mode	0.04% + 130 μA		
	Constant voltage mode	0.02% + 3 mV		

	Constant resistance mode	0.1% + 230 mS		
	Constant power mode	0.06% + 4 mW		
5.	Operating modes:	constant current (CC), constant voltage (CV), constant resistance (CR), constant power (CP)		
6.	Min sample rate	20 microseconds for datalogging		
7.	Slew Rates for min CC mode	40 A/ms, >75 V/ms		
8.	Programming Resolution min CC mode	<10 µA in CC, <200 µV in CV, <0.1 µV in Cp		
9.	DC electronic loads are fully SCPI programmable with built-in USB, LAN, and optional GPIB interfaces.			
10	Protection	OCP, OVP & OPP		
11	Fully integrated voltmeter and ammeter to simultaneously measure the voltage and current for the DUT.			
12	Digital I/O for Fault, Int, Trigger in/out			
13	Remote sense technology should have 4 wire to eliminate voltage drops.			
14	Continuously Data log voltage, current and energy parameters			
15	Measurement data can save externally on a USB memory device as a .CSV file			
16	Need to perform precise transient analysis with a scope function.			
17	Displays results on a 4.3-inch color LCD screen.			
18	Dynamic load profiles with List (continuous, pulse, or toggle)			
19	Software for the PC or a soft front panel via a web interface allows uses to operate the electronic load remotely, execute test sequences, log data, and integrate with other test instruments.			
20.	Weight max <10Kg			
21.	Input power 100 VAC to 240 VAC (±10%), 50/60Hz			
22.	Safety UL 61010-1 3rd edition, CAN/CSA-C22.2 No. 61010-1-12, IEC 61010-1:2010 3rd edition.			
23	Warranty: 3 Years minimum			

XII. Digital Multimeter (6 1/2-digit): Quantity: 4 Nos.

Sl No	Parameter	Specification	Complied /Not Complied	Ref.Pg.No
1	Digits of Resolution	6 ½ Digit		
2	DC accuracy	Better than 30 ppm		
3	Max reading rate	Better than 40,000 rdgs/s		
4	Memory	Greater than 45,000 rdgs		
5	DC voltage range	100mv ≥ 1000 V or larger		
6	AC voltage (RMS range)	200 mv ≥ 750V or larger		
7	Current rating (DC and AC)	1uA dc to 10A		
8	2- and 4- wire resistance	100 Ohm and 1000 M ohm		
9	Capacitance	1nf to 100uF		
10	Frequency	3 Hz to 300 kHz		
11	Temperature	RTD/PT100, Thermistor,		

			K, J, T, E & N type Thermocouples		
12	Display	Color graphics			
		Histogram, bar chart, Trend			
13	USB, USB host	Yes			
14	LAN/LXI	Yes			
15	Basic 1-Year DCV Accuracy	<0.01%			
16	Features	Provides a data logging mode for easier trend analysis and a digitizing mode for capturing transients			
17	Measurement functions	DCV and ACV			
		DCI and ACI			
		2- and 4-wire Resistance			
		Frequency			
		Capacitance			
		Diode test			
		Continuity test			
		Temperature			
18	Compactable drivers	LabVIEW & MATLAB			
19	Test leads	Test lead probes with retractable sheath (2 units)			
		Fine tip probes (2 units)			
		SMT Grabbers (2 units)			
		Mini Grabber (1 Unit)			
20	Warranty	3 Years minimum			

XIII. Data Acquisition System: Quantity: 2 Nos.

Specification	Complied /Not Complied	Ref.Pg.No
The LXI Compliant 60 Channel Data Acquisition System should be a modular system to record parameters like Voltage, Current, strain, Capacitance, Temperature & Pressure.		
The system should be configurable as a Data Logger, Data Acquisition System and High-Performance Switching Unit. It should be capable of working Stand Alone or be controlled from a Controller.		
MEASUREMENTS		
m) DC Volts up to 300V with <150nV resolution and <0.0045% basic DC V accuracy		
n) 6 1/2 Digits with 22-bit resolution		
o) Input Impedance > 10 GOhm in 100mV, 1V & 10V range		
p) AC Volts True RMS up to 300V with 300 KHz		
q) 2 & 4 Wire Resistance Measurement		
r) Resistance 100 Ohms to 1000 MOhms		
s) Frequency & Period up to 300 KHz		
t) Temperature Measurement with RTD, Thermistor 2.2 & 10kohms & Thermocouple (B, E, J, K, N, R, S, T)		

	Specification		
u)	DC & AC Current 1uA range to 1A directly		
v)	Measures and converts 12 different input signals: Temperature with thermocouples, RTDs and thermistors, DC/AC volts, 2- and 4-wire resistance, frequency and period, DC/ AC current and capacitance 1nF to 10uF, Diode test 5V & Strain measurement		
w)	LCD Display		
x)	Calibration certificates traceable to National / International standards		
SYSTEM CHARECTERISTICS:			
m)	System Speed - >100rdgs/sec		
n)	Scanning Inputs - Analog & Digital		
o)	Scan Triggering - Int, Ext, Manual, Software, on Ch Alarm		
p)	Scan Count - 1 to 50,000 or continuous		
q)	Scan Interval - 0 to 99 hours, 1ms step size		
r)	Alarms - Hi, Lo with 4 TTL Compatible Alarm Outputs		
s)	Memory – 1Million points with time stamp & real time clock		
t)	Maths - Scaling (Mx + B) & Min/Max/Avg		
u)	Relay Maintenance - Should count each relay closure.		
v)	Should come with powerful plug & play Logger software		
w)	Upgrade modules & main frame		
x)	Computer Interface USB, LAN/LXI & USB Host Port		
Warranty	3 Years minimum		

XIV. Sixteen Channel Digital multiplexer: Quantity: 6 Nos.

	Specification	Complied /Not Complied	Ref.Pg.No
1	No of Channels: 16 Channels		
2	Scan Speed: Scanning up to 250 ch/s		
3	Offset Voltage: <6μV		
4	Bandwidth: 10MHz		
5	Built-in thermocouple reference junction		
6	Max Input: 300V AC & DC isolated input		
7	Configuration: 2 wire or 4 wire - user selectable		
8	Warranty minimum 3 years		
9	Sixteen channel digital multiplexer should be compatible with Data acquisition system mention in item no. XIII.		

XV. Twenty Channel solid state multiplexer: Quantity: 6 Nos.

	Specification	Complied /Not Complied	Ref.Pg.No
1	No of Channels: 20 Channels		
2	Scan Speed: Scanning up to minimum 450 ch/s		
3	Offset Voltage: <6μV		

4	Bandwidth: 10MHz		
5	Built-in thermocouple reference junction		
6	Max Input: >100V isolated input		
7	Configuration: 2 wire or 4 wire - user selectable		
8	Warranty minimum 3 years		
9	Twenty channel solid state multiplexer should be compatible with Data acquisition system mention in item no. XIII.		

(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)

**SIGNATURE OF BIDDER ALONG WITH
SEAL OF THE COMPANY WITH DATE**

FINANCIAL BID (PROFORMA) - BILL OF QUANTITIES (BOQ)
Item Name: "High Frequency Power Electronics Measurement (HFPEM)"
Tender No. PH/MSRA/124/2023/HIGHFREQEPEM

It. No	Description of work	Quantity	Units	Basic Rate in INR	GST in Percentage	Total Amount with taxes in INR
1.	**EMI RECEIVER With 3 Years Warranty**	1	No.			
2.	**Four-port Vector Network Analyzer (VNA) With 3 Years Warranty**	1	No.			
3.	**Digital Storage Oscilloscope >32 GHz, 4-channels With 3 Years Warranty**	1	No.			
4.	**Digital Storage Oscilloscope ≥ 1GHz, 8-channels With 3 Years Warranty**	1	No.			
5.	**High voltage probe (100:1)**	2	Nos.			
6.	**High voltage differential probe**	4	Nos.			
7.	**High sensitivity Clamp-On AC/DC current probe**	2	No.			
8.	**Rogowski AC Current probe**	1	No.			
9.	**AC/DC current probe (10 MHz, 150 A):**	2	Nos.			
10.	**Digital Storage Oscilloscope, 500 MHz, 4 Channel With 3 Years Warranty**	3	Nos.			
11.	**Dual input Electronic Load (600 W) With 3 Years Warranty**	2	Nos.			
12.	**Digital Multimeter (6 1/2-digit): With 3 Years Warranty**	4	Nos.			
13.	**Data Acquisition System: Quantity With 3 Years Warranty**	2	Nos.			
14.	**Sixteen Channel Digital multiplexer With 3 Years Warranty**	6	Nos.			
15.	**Twenty Channel solid state multiplexer With 3 Years Warranty**	6	Nos.			
	Grand Total					

Total Amount Rupees in words _____

FORMAT FOR AFFIDAVIT OF SELF-CERTIFICATION UNDER PREFERENCE TO MAKE IN INDIA – PER ITEM

Tender Reference Number:

Name of the item / Service:

Date: _____
I/We_____S/o, D/o, W/o, _____
Resident of

_____

Hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Policy vide GoI Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P- 45021/102/2019-BE-II-Part (1) (E-50310) Dt.4th March 2021 and any subsequent modifications/Amendments, if any and

That the local content for all inputs which constitute the said item/service/work has been verified by me and I am responsible for the correctness of the claims made therein.

Tick (✓) and Fill the Appropriate Category	
☐	I/We_____[name of the supplier] hereby confirm in respect of quoted items thatLocal Content is equal to or more than 50% and come under **"Class-I Local Supplier"** category.
☐	I/We_____[name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to 20% but less than 50% and come under **"Class-II Local Supplier"** category.

- The details of the location (s) at which the local value addition is made and the proportionate value of local content in percentage

Address _____ _____ __   Percentage of Local content: _____%

_____

For and on behalf of .... (Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)
<Insert Name, Designation and Contact No.>

[Note: In case of procurement for a value in excess of Rs. 10 Crores, the bidders shall provide this certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.]

This letter should be on the letterhead of the quoting firm and should be signed by a competent authority. Non-submission of this will lead to Disqualification of bids.

(To be given on the letter head of the bidder)

No._____   Dated: _____

CERTIFICATE

(Bidders from India)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I am not from such a country.

OR *(whichever is applicable)*

(Bidders from Country which shares a land border with India)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I from _____ (Name of Country) and has been registered with the Competent Authority. I also certify that I fulfil all the requirements in this regard and is eligible to be considered. *(Copy/ evidence of valid registration by the Competent Authority is to be attached)*

Place: Signature of the Tenderer
Date: Name & Address of the
                                                                             Tenderer with Office Stamp

CENTRE FOR INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH (IC&SR)
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI 600 036

ELECTRONIC CLEARING SERVICE (Credit Clearing)/ REAL TIME GROSS SETTLEMENT (RTGS) FACILITY FOR RECEIVING PAYMENTS

A. Details of Account Holder

Name of the Institution	Indian Institute of Technology - Madras
Complete Contact Address	Industrial Consultancy and Sponsored Research Indian Institute of Technology-Madras, IIT- Madras Campus Post Office, Sardar Patel Road, Guindy, CHENNAI - 600 036
Telephone No./ Fax No.	Tel - 044-2257 8356
E- mail ID of the FO/AO/REG/DIR	dricsr@iitm.ac.in

B. Bank Account Details:

Institution Account Name (As per Bank Record)	The Registrar, Indian Institute of Technology - Madras
Account No.	2722101003872
Account Print Name	IIT F A/C , The Registrar IIT Madras
IFSC CODE	CNRB0002722
Bank Name (in full)	Canara Bank
Branch Name	IIT-Madras Branch
Complete Branch Address	Canara Bank, IIT-Madras Branch, IIT- Madras Campus Post Office, Sardar Patel Road, Guindy, CHENNAI - 600 036
MICR No.	600015085
Account Type	Savings Account

Certified that the Institute's account is in an RTGS enabled branch.
I hereby declare that the particulars given above are correct and complete.

Date: Signature of the Competent Authority
of the Institution with seal.