



Department: **ELECTRONICS AND ELECTRICAL COMMUNICATION**

ENQUIRY NO.: **IIT/ECE/ENQ/MEMS/24/2018 -19**

Date: **05/02/2019**

INVITATION FOR TENDER FOR SUPPLY OF EQUIPMENT

Sealed tender offers are invited in two separate sealed covers (*Technical and Commercial offers*) from eligible manufacturers / suppliers or their direct Indian agents for the supply of the following equipment.

Name of the Equipment: **Up gradation of Four Point Probe Measurement Setup**

Please send offers, **ALONG WITH DESCRIPTIVE CATALOGUE/ BROCHURE**. The validity of the bid should be at least four months (120 days) or more from the date of the opening of this tender. Please ensure that your quotation reaches not later than 04.03.2019 at 17:00 Hrs at the following address:

To,

The Head,

Department of Electronics & Electrical Communication Engineering,
Indian Institute of Technology Kharagpur – 721 302, West Bengal, India

Earnest money of Rs. 25,000/- (Rupees Twenty five thousand only) (Refundable) is to be deposited in the form of Account payee Demand Draft from any national / commercial bank in favour of IIT Kharagpur, payable at Kharagpur, India. Any bid which is not accompanied with an EMD shall be summarily rejected. Earnest money deposited will be forfeited if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. No interest will be paid on the earnest money of the unsuccessful bidders.

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|---|---|
| Tender Reference | IIT/ECE/ENQ/MEMS/24/2018 -19, Dated 05/02/2019 |
| Tender Fee | 1000 |
| Last Date and Time for submitting the tender document | 04.03.2019 at 17:00 Hrs (Indian time) |
| Time and Date of Opening of Technical Bids | 05.03.2019 at 11:30 Hrs (Indian time) |
| Place of Opening Tender | Department of Electronics & Electrical Communication Engineering, Indian Institute of Technology Kharagpur-721302, West Bengal, India |
| Address of Communication | As stated above |
| Contact Telephone Numbers | +91-3222-283554 |
| E-mail | tkb@ece.iitkgp.ac.in |

"Any corrigendum/addendum shall be published only in Institute Website and CPPP"

Handwritten signature and date: 5/2/2019

Handwritten signature and date: 06/2/19

Tender Specification for Up Gradation of Four Point Probe Measurement Setup
(Model No FPP-5000 Make: Miller Design & Equipment):

- **Measurement Function and Range:** Digital computation should allow the direct, error free, display of sheet resistivity in ohm/square from 1.1 m ohm/sq to 450Kohm/sq, slice resistivity in ohm-centimetres from 4.19x10.2mohm-cm to 17.1kohm-cm, V/I in ohms from 0.25m ohm to 99.9k ohm or metallization thickness in kilo-angstroms from 20 angstrom to 243 K angstrom use of graphs, tables or mechanical calculations and other associated errors should be eliminated.
- **Operation:** Wafer should be placed on moulded wafer carrier, and closes cover to initiate test. Unit automatically ranges and displays correct reading including decimal point, multiplier and wafer type simultaneously.
- **Probe Tip and Wafer Protection:** The probe tips should remain below the stage of the Four Point Probe Measurement Setup until the cover is lowered, eliminating damage to the wafer. Probe tips should be remain unpowered until after contact with wafer to eliminate arcing with consequent probe tip erosion and wafer pitting
- **RFI/Light Shield:** Cast aluminium RFI/Light Shield should be used in the Four Point Probe Measurement Setup for eliminating problems due to radio frequency noise and photoelectric effects when measurement high resistivity layers.
- **Direct Digital Display:** Test results should be displayed on direct five digit LED display.
- **Penetration Function:** For testing low contact resistance, built-in penetration function should be at least 170V, 4m sec pulse to probes through a 10M resistance.
- **Automatic type testing:** Automatic type testing (P-N) would be determined by either a Rectification of Thermoelectric test. The substrate type will be indicated by illumination of either the P or N indicator. Invalid or questionable tests should be indicated by illumination of both indicators.
- **Forward and reverse current test:** For instant verification of proper probe tip contact Automatic forward and reverse current test should be available.
- **Cycle Time:** Total test time should be less than 2 Secs. (typically 1 sec)
- **Electronic Accuracy:** $\pm 0.5\%$ on all but extreme ranges for contact resistance up to 5 Kohm.
- **Voltage Detector:** Input impedance and input bias current should be 10Mohm and 50pA respectively.
- **Operating Temperature Range:** 15° C to 30°C
- **Power:** 115/230 volts $\pm 10\%$, 50/60 Hz, Less than 12 watts.
- **Dimensions:** 15" wide, 16" deep, 5" high (lid closed), 15" high (lid open)
- **Four Point Probe Measurement setup should includes the following items:**
 - Choice of one 50mm (2"), 75mm (3"), 100mm (4"), 125mm (5") or 150mm (6") wafer carrier/pressure disk; One fragment wafer carrier/ pressure disk; one probe head removal tool; one probe head setting block and one maintenance manual.

- The following probe heads should be available for the Probe Head Assembly with Mounting Block:
 - 2.0 mill radius, 70-180 gm/pin for silicon slices and ingots
 - 5.0 mill radius, 40-70 gm/pin for epilayers < 1 μ thick with polished and unpolished surface
 - 2.0 mill radius, 40-70 gm/pin for epilayers > 1 μ thick with polished and unpolished surface with bulk resistance of >1 Ω cm
 - 10.0 mill radius, 40-70 gm/pin for metallization layers

User Details: Supplier must confirm that they have installed at least 10 systems in India, 15 systems Worldwide.

Service Facility: Supplier should mention their details of service setup and man powers, which are responsible for after sales support. Response time should be within 24 hrs. Also provide technical support for 10 years.

Terms & Conditions:

1. Warranty: (1 + 2 years from date of installation) except probe head.

2. Installation: Free of charge by factory trained Service Engineer.

After Sales Service:

Annual Maintenance Contracts after completion of warranty period.

Delivery:

6 – 8 weeks from the date of receipt of valued order with advanced payment.

GENERAL TERMS & CONDITIONS

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HEREUNDER:-

1. TENDERS ARE INVITED COMPLYING THE REQUIREMENT FOR TENDERS AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY'S / FIRM'S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPES CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPES SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOPE.

THE FOLLOWING DOCUMENTS ARE REQUIRED FROM THE INDIAN AGENTS OF FOREIGN FIRMS:

1.1 FOREIGN PRINCIPAL'S PROFORMA INVOICE INDICATING THE COMMISSION PAYABLE TO THE INDIAN AGENT AND NATURE OF AFTER SALES SERVICE TO BE RENDERED BY THE INDIAN AGENT.

1.2 COPY OF THE AGENCY AGREEMENT WITH THE FOREIGN PRINCIPAL INDICATING THE NATURE OF AFTER SALES SERVICES, PRECISE RELATIONSHIP BETWEEN THEM AND THEIR MUTUAL INTEREST IN THE BUSINESS.

2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.
3. PLEASE CONFIRM WHETHER YOU ARE AUTHORISED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.
4. **PRICE BIDS FOR FOREIGN FIRMS:** PRICES ARE TO BE QUOTED ON 'EX-WORKS' DULY PACKED , ON "FCA/FOB" INTERNATIONAL PORT" BASIS AND ALSO INCLUDING AGENCY COMMISSION PAYABLE TO YOUR INDIAN AGENTS, IF ANY SHOWING CLEARLY THE FOLLOWING BREAK UP:-

- I) EX-WORKS PRICE
- II) PACKING & FORWARDING
- III) FREIGHT
- IV) ANY OTHER RELEVANT EXPENSES.
- V) TAXES PAYABLE BY THE INSTITUTE

INSURANCE WILL BE PAID BY OUR INSTITUTE SEPARATELY AND SHOULD NOT FORM PART OF THE QUOTED PRICE.

PRICE BIDS FOR INDIAN FIRMS: PRICES ARE TO BE QUOTED ON F.O.R., IIT KHARAGPUR, ON DOOR DELIVERY BASIS CLEARLY SHOWING THE BREAK UP.

5. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 120 DAYS FROM THE DATE OF OPENING.

6. INDIAN AGENTS ADDRESS AND PERCENTAGE OF AGENCY COMMISSION INCLUDED IN ABOVE F.O.B./EX-WORKS PRICE. (THIS WILL BE PAID TO THE INDIAN AGENTS IN INDIAN RUPEES ONLY AND NOT IN **FE**). PLEASE ENCLOSE COPY OF AGENCY AGREEMENT ENTERED INTO WITH YOUR PRINCIPALS INDICATING THE NATURE OF AFTER SALES SERVICES OF INDIAN AGENTS, PRECISE RELATIONSHIP & MUTUAL INTEREST IN THE BUSINESS.
7. **MEASUREMENTS/WEIGHT:** NETT/GROSS OF THE CONSIGNMENT. IN CASE OF AN ORDER, YOU SHALL USE AIR WORTHY PACKAGE (AS APPLICABLE) DULY CERTIFIED WITH DOCUMENTS – PLYTO – SANITARY CERTIFICATE (AS PER QUARANTINE ORDER 2003).
8. **SCOPE OF SUPPLY:** SHOULD INCLUDE FREE INSTALLATION AND COMMISSIONING
9. **PAYMENT TERMS FOR FOREIGN FIRMS**

The offer will be made on a single currency and only one PO will be issued for the entire scope of the supply.

- A) 90% PAYMENT THROUGH SIGHTDRAFT/FORIGN DEMAND DRAFT/LC (EXCEPTIONAL CASES)/SWIFT TELE TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER AND CONDITION AND 10% AFTER SUCCESSFUL INSTALLATION & COMMISSIONING.
- B) BANK CHARGES ON LC/SD (WITHIN INDIA APPLICANT ACCOUNT AND OUTSIDE INDIA TO BENEFICIARY ACCOUNT).

PAYMENT TERMS FOR INDIAN FIRMS

- A) 100% PAYMENT THROUGH CROSSED ACCOUNT PAYEE CHEQUE / ELECTRONIC TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER & CONDITION AND SUCCESSFUL INSTALLATION & COMMISSIONING.
- B) ENSURE MENTIONING
 - i) BANK DETAILS OF THE BENEFICIARY, GST NO. AND PAN NUMBER
 - ii) FULL NAME AND ADDRESS OF THE BENEFICIARY ON WHOM PURCHASE ORDER HAS TO BE PLACED

10. WHETHER ANY EXPORT LICENCE IS REQUIRED FROM YOUR GOVERNMENT, IF SO, PLEASE CONFIRM WITH DETAILS.
11. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.
12. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXEMPTION IN TERMS OF GOVT. NOTIFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.
13. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IF THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM

THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER MONTH OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.

14. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.
15. ONLY THOSE BIDDERS WHO'S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.
16. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.
17. CONDITIONAL OFFER WILL NOT BE ACCEPTED.
18. LATE TENDERS I.E. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.
19. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-
 - A) INCOME TAX RETURN (3 YRS) AND LATEST SALES TAX RETURN (GST No.), AND PAN NO.
 - B) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY'S KEY PERFORMANCE

| DESCRIPTION | JAN. TO MARCH | APRIL TO JUNE | JULY TO SEPT. |
|--------------------|---------------|---------------|---------------|
| GROSS REVENUE | | | |
| PROFIT BEFORE TAX | | | |
| PROFIT AFTER TAX | | | |
| RETURN ON INVESTED | | | |
| CAPITAL (ROIC) | | | |

- C) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.
- D) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SIMILAR TYPE OF EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.
20. **WARRANTY / GUARANTEE:** THIS COMPREHENSIVE WARRANTY / GUARANTEE SHALL REMAIN VALID FOR **36 MONTHS** AFTER THE GOODS (OR ANY PORTION THEREOF AS THE CASE MAY BE) HAVE BEEN DELIVERED AND COMMISSIONED TO THE FINAL DESTINATION.

21. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO'S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.

20. ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO **Office of the Head, Dept of Electronics & Electrical Communication Engineering, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR - 721 302** AND FOR ANY TECHNICAL/ SPECIFICATION RELATED QUERY PLEASE CONTACT:

Prof. T.K. Bhattacharya
Lab. In-Charge, MEMS Lab.,
Department of Electronics and Electrical Communication
Engineering, Indian Institute of Technology, Kharagpur-721302
[Ph.: 03222-283554]

IMPORTANT

1. IIT Kharagpur authority may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
2. Promptly make arrangements for repair and / or replacement of any damaged item (s) irrespective of settlement of claim.
3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
4. For any query pertaining to this bid document correspondence may be addressed to **Prof. T. K. Bhattacharyya**, at the address mentioned above.

LAST DATE FOR SUBMISSION OF SEALED BIDS: 04.03.2019

- 1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.
 - 2) Fax, e-mail Tender will not be accepted.
 - 3) The General Terms and Conditions as stated above relate to supply of stores / equipment /assets etc. and for specific service other terms and conditions of the Institute will apply.
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FORMATFORPRICEBID

Format to be filled up by
the Agency

TenderNo.....

Dated.....

1. Name of Tender:

2. Name of Firm/Bidder:

3. Address:.....

4. Phone/ Fax/ Mobile/ Email:.....

| SL.NO. (a) | Description (b) | Unit Basic Price (inRs.) (c) | GST (in Rs.) (d) | Total (All Inclusive)(inRs.) (e=c+d) |
|------------|-------------------------------|------------------------------------|---------------------|--|
| 1. | Brand: _____ Model : _____ | | | |

**Signature of the bidder
with seal**