

INDIAN INSTITUTE OF TECHNOLOGY KANPUR
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Enquiry no.: PHY/SoM/EQP/2012/1

Enquiry date: 2/11/2012

Closing date: 15/11/2012

Request for submission of quotation for “Magnetolectric response measurement system”

Dear Sir/Madam,

Sealed quotation(s) are required on or before November 15th latest by 5PM meeting all technical specifications as mentioned below:

Terms and conditions:

Quotations should have a validity of a minimum of 60 days.

The equipment should be provided with a minimum warranty of 1 year.

Quotations are required in duplicate in a sealed envelope with enquiry number mentioned on the envelope.

The delivery period should be specifically stated.

The rate offered should be F.O.B (specify city).

Institute is exempted from payment of Excise Duty under notification no.10/97.

Institute is entitled to avail concession rate of sales tax as admissible under Sub-sec 5 of Sec 8 C.S.T Act 1956 applicable to Educational/Research institution in inter-state purchase.

SPECIFICATIONS

Minimum General Specifications:

1. The system is intended to investigate the P-E hysteresis, CV, IV as a function of applied DC & AC magnetic field & temperature for non-piezoelectric samples.

2. Magnetolectric Response Task capability to measure magnetolectric (ME) coupling coefficients as a function of magnetic field and temperature for thin film/ heterostructures and bulk samples.

3. The test & measurement system should have provision to apply a background magnetic bias field to the sample in addition to the AC & DC stimulus so as to carry out DC & AC Magnetolectric Measurement as a function of magnetic field on a sample while measuring its charge generation.

4. The charge measurement input should operate as an electrometer for best resolution and flat frequency response.
5. The test frequency must extend from a test period of 30 seconds for accurate measurement of large area bulk ceramic capacitors down to 10ms for characterizing small-scale but leaky thin-film capacitors. Pulse measurements should be as narrow as $1\mu\text{s}$.
6. The minimum required leakage resolution should be 2pA and the parasitic input capacitance must be less than 100 femtofarads.
7. The voltage ramp rate of the output must be controlled such that the current capacity of the measurement input is not exceeded during a test.
8. The output of the test system must be an arbitrary waveform generator in order to produce any waveform for hysteresis, pulse, leakage, and CV tests without a hardware configuration change.
9. The software controlled testing equipment should be capable of executing all measurements with provision for automatic data storage and transfer to other testers using network protocols.
10. Sample cell(s) compatible for data acquisition with thin film and bulk ceramic pellet samples over a broad range of temperature (including low temperature) and frequency.

Other details of the specifications are given below:

- Output Range: $\pm 200\text{V}$
 - o 16-bit Arbitrary Waveform Generator output
 - o 100 points in $10\mu\text{s}$
 - o 1000 points in 30 seconds
 - o Pulse Widths down to $1\mu\text{s}$ and up to 1s
 - o Controlled output ramp for maximum accuracy
- Polarization Measurement
 - o 18 bit analog to digital converters – $76\mu\text{V}$ sensitivity on 10pF C_{sense}
 - o $0.5\mu\text{s}$ capture rate with $0.1\mu\text{s}$ interlace facility
 - o Polarization, output voltage, and SENSOR inputs captured simultaneously
 - o Minimum charge sensitivity $\rightarrow 1.0\text{fC}$ or better
 - o Max Hysteresis Frequency 100 kHz
 - o Min Hysteresis Frequency $<1\text{ Hz}$

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