

**Bharat Heavy Electricals Limited**

(A Government of India Undertaking)

Electronics Division

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Tender document for the supply of INCIRCUIT TESTER

R F Q Number : TRSM900005

Tender Qty : ONE Number

Tender Due Date and Time : 18.01.2008 13.00 Hrs

Tender Opening Date and Time : 18.01.2008 13.30 Hrs

Place of opening of Tender : SA – MM Conference hall

Scope: Supply, installation and commissioning of In-circuit Tester

1. Two part Bid - Tender shall be submitted in two parts :

- a. Part I – Techno commercial bid without prices.
- b. Part II – Price bid

2. Earnest Money Deposit : EMD of Rs 2,00,000/- (rupees two lakhs only) shall be submitted in the form of DD along with the bid. EMD in the form of DD / Pay order only is acceptable & any other form is not acceptable and the bid is liable for rejection. EMD amount doesn't carry any interest. The same will be converted as Security Deposit for the successful bidders and for unsuccessful bidders the same will be refunded after finalization of the order. For successful bidders EMD will be refunded after submission of PBG.

3. Delivery Period: Equipment shall be delivered, within 4 months from the date of placement of technically & commercially clear purchase order.

4. Terms and conditions:

1. All the Bidders shall meet the **pre-qualification criteria** and Comply with **Technical Specification** mentioned in this specific tender.
2. Indian Bidders are required to comply with the **general terms and conditions** as per SA – 01 (Annexure –I)
3. Foreign Bidders are required to comply with the **general terms and conditions** as per SA – 02. (Annexure –II)



REF: 384/SKP/FR3/PQ01
Pre Qualification Criteria

01. The vendor shall be an Original Equipment Manufacturer (OEM). Only the OEM or their authorized dealers in India along with an authorization letter can submit offers. An authorized Representative/Dealer in India, cannot quote for the same equipment from more than one OEM.
02. The offer shall be only for Standard Catalog Items from the manufacturer and not custom-made one. All the specifications should be supported by Standard Catalogs and Data Sheets of the manufacturer.
03. Offer shall be for a new equipment and not for any refurbished / used equipment. All the parts used in the machine shall also be new and not used / refurbished ones. A declaration to the above effect to be furnished.
04. Foreign OEM shall have Authorized Indian dealer(s) / representative(s) for After-sales service and support. The authorization letter for the dealer/ representative shall be provided.
05. The vendor should have already supplied and installed 3 nos. of similar machines in India during the past 5 years and these must be operating satisfactorily for at least past one year. The details of the customers with contact details, machines installed, date of installations etc. to be provided.
06. The vendor or their authorized service representatives shall have trained engineers in India for commissioning & service for the offered equipment and shall be in a position to provide prompt after sales service and spares support for our installations.
07. The vendor shall be in a position to undertake AMC or provide service support for the equipment supplied, after the expiry of the warranty/ guarantee period either directly or through a service representative.
08. If required by BHEL, the vendor shall arrange for a demonstration of the machine or a similar system operating in India.
09. The vendor shall furnish a comprehensive warranty for at least 12 months from the date of commissioning.

NOTE:

1. Pre qualification will be carried out based on the details furnished by the vendor / feedback from their customers / inspection of the company / product if required by BHEL and at its sole discretion.
2. The Pre qualification criteria are mandatory requirements and the technical bids will be evaluated only when the Pre Qualification criteria are met.

**SPECIFICATIONS FOR In-Circuit-Tester**

Ref: 384/AT/FR3/ICT

Technical quote must include compliance statement with respect to EACH of these specs. Please also indicate clearly the standard and optional components & dependancies.

S_Basic:

General purpose high performance Manufacturing line In-Circuit Tester with following features

Basic Requirements

This manufacturing test ICT is expected to supplement and enhance the test capabilities of the existing manufacturing at BHEL-EDN and gearing up for products to be introduced.

All the present manufacturing test fixtures and programs were developed for GR TS124/128, GR2284i. These also extensively utilise GR Libraries, and our in-house developed libraries targeted to GR systems.

All this investment in IP and hardware needs to be protected and useable without any significant modification to the fixturing and programs and without compromising on the test quality and coverage and also the device protections.

As the two systems (existing and proposed) are to be used simultaneously, and interchangeably, for the same product line, one-time migration is not an acceptable solution. These need to remain aligned forever, as minor but small changes are introduced often enough. This assumes further significance in view of collaborative developments and use of similar systems at our technology partners.

Availability of ICT test library models including (but not limited to) ISP & BSDL codes is also of concern. Such compatibility will also ensure that the codes targeted to our GR systems also remain available across the manufacturing test platforms.

Many of our programs and fixtures targeted on legacy GR2276 system also depend on this compatibility with minimal derated/degraded life extension as we need to support our supplies for a decade or more.

If and only if the offered solution is found suitable as per above criteria, either directly or by emulation, further clauses will be evaluated.

Vendor must provide adequate evidence to support above claims including at least 2 supplies where this has been implemented alongwith contact details, at least one of them in operation for more than one year. If required by BHEL, vendor shall be in a position to arrange a visit to such installation for further evaluation and interactions with the user.



S_Main:	<u>Main System</u> Full manufacturing test ICT Analog and digital testing All pins with Universal Hybrid (Analog & Digital) Source & Sink capability Industry standard controller with open system architecture & OS LAN connectivity with Ethernet Possibility of extending measurements over integrated IEEE488 bus & mux Minimum approx 3500 hybrid pins. With 2:8 or better multiplexing Integrated Vacuum operated interface for bed of nails fixtures Antistatic work surfaces Built in self test & calibration Option: possibility to increase pins to > 6000 General: Provide breakup of all configurable options and purpose of the same for BHEL to decide on selectable options.
S_SW:	<u>Software</u> Board testability and fault coverage analysis & statistics reporting Fully Automatic test generation Analog & mixed mode function test capability Automatic Analog & digital guarding Fixture report generation for drilling & wiring Fixture ID Graphical User interface for programming, operation and debugging Support for JTAG, boundary scan tests at component/ connectivity and cluster levels Off-line programming station & software. Any licences required for programming and/utilising any of the tests offered. Optional upgrades for at least 3 years. Any other bundled or separate software required to import and utilise module design data for generating program and fixture reports and automating the test generation process for new designs.
S_An:	<u>Analog specs</u> Standard tests for Shorts/ opens/ jumpers etc with programmable thresholds Standard tests for Components like Resistance, Impedance @ upto 10KHz, Inductance, Capacitance, Diode, Transistors including beta, FET, Zeners, SCR, OPAMPs etc. without external eqpt or programming 10 bit or higher resolution fully programmable for DC, DC offset & AC (reactance stimuli) Power-off & Power-on analog tests Upto 6 wire general measurements 2 or more programmable DC V/I sources 16bit bipolar >15V, >=500mA wih programmable compliance High Volts >= 100V @ upto 50mA min Measurements: min 200V, 150mA DC & upto min100KHz AC, Waveform generation for standard And arb signals, upto 100KHz, bipolar >15V/ 500mA p-p, 16bit



S_Dig:	Digital specs 5MHz data Drive/ Sense with pattern memory > 16K, more by looping/ nesting All pins independent and simultaneous, Drive upto 500mA @ <=2 ohms, Sense @ >100 Kohm Independently per pin Programmable drive levels & sense thresholds for TTL, LVTTTL, ECL and other families and user defined, of at least -2.5V to + 5.5V, Multiple (16 or more) such programmed thresholds available for all pins simultaneously Auto sense for the Drive pins Programmable Current limiting and Shortckt/ Overvoltage protection on all pins In-Line device programmer for Flash & other ISP devices Counters, CRC signature checks etc. Option1: Higher Driver/ sensor voltages for 10V CMOS: >+5V programmable threshold Option2: Higher Driver/ sensor voltages High level logics: -6 to +10V
S_Alt:	Alternate test strategies Vectorless testing for non-testable and non-accessible components Tests for components without library support Tests for open leads for ICA, incl BGAs Test methods for connectors/ sockets/ switches Elec. Cap polarity detection, Cold solder detection Limited Board level functional checks with or without external GPIB & other instrumentation
S_HW:	<u>Other Hardware</u> DUT Power Supplies Fixed and programmable, Hi-Current and Voltage, at least 8 nos. Typically powering DUT at upto 2 sources of approx 150W, in a mix of 5V/ 12V-15V/ 24V/ 48V applications. Field-Upgradeable to more nos. or ranges.
S_FT:	Optional Functional test Capability of Analog, Digital and mixed mode functional testing Through measurement bus Frequency & time measurements up to 100MHz additional 1MHz 10V 16bit AC source Flash, E(E)PROM, FPGA and other ISP (In-System-Programmable devices) programming, INCLUDED ACCESSORIES : O&M and service manuals. All Necessary hardware & software for upkeep, maintenance, performance verification & routine calibration



TRAINING: Optional, On all aspects for two Engineers : 2 to 4 weeks

RECOMMENDED SPARES : For three years of troublefree operation.

Must cover all site-replaceable parts to minimise downtimes.

20% of pin boards, and at least one each for rest of the replaceable electronic hardware must be offered as configurable spares list.

SUPPORTED LIFE FOR SYSTEM & SPARES : At least 10 years from commissioning.

POWER : AC 230V 1-ph, or 400V 3-ph +/- 10% 50Hz

ENVIRONMENT 15 to 35 deg C at upto 80% humidity.

WARRANTY On site, comprehensive, 1 year, with option of extended warranty (to be quoted)

AMC On site, with options of selecting:

- Service support only, parts by BHEL.
- comprehensive support (parts & Labour)
- less than 1 working day response time for both options.