


REQUEST FOR QUOTATION

	BHARAT HEAVY ELECTRICALS LIMITED Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 INDIA	RFQ NUMBER: SAMRC24007 RFQ DATE : 17.10.2023	Due Date/Day: 17.11.2023 FRI Time : 13:00 HRS Tender Box : Reception Area Opening Venue: SUB ASSLY PUR
MMI:PU:RF:003	(address for communication) :		(for all correspondence)
		Purchase Executive : Sarita Phone : 080 26998239 Fax : E-mail: sarita@bhel.in	

SI No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	DV0688173315 IGBT 4500V 1200A * HSN/SAC : 8536 Mfr Part No.- 5SNA1200G450300 Vendor - ABB SWITZERLAND LTD Mfr Part No.- CM1200HG-90R Vendor - MITSUBISHI CORPORATION Mfr Part No.- MBN1200H45E2-H Vendor - HITACHI LTD. Test Certificate IGBT 4500V 1200A. PURCHASE SPECIFICATION: PS4062320	18,000	NO	18,000	20.04.2024

Total Number of Items - 1

- 1.
- 2.

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES:

1. This RFQ is governed by:
 - a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at <http://edn.bhel.com> (**RFQ-PO Terms & Conditions**)
 - b) Any other specific Terms and Conditions mentioned.
 2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same.
- * The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

Sarita
Sub-Assembly

1 OF 1



**PURCHASE SPECIFICATION
FOR 4.5kV 1200A IGBT**

PS4062320

REV. NO: 00

PAGE : 00 OF 02

SPECIFICATION FOR 4.5kV 1200A IGBT

REVISION HISTORY SHEET

COPYRIGHT AND CONFIDENTIAL.
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
 It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV. NO.	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	20.06.2019	FIRST ISSUE	-----	Hari Kalluru	T J GIRISH

APPROVED BY T J GIRISH *[Signature]*

PREPARED BY
K. Han
Hari Kalluru

ISSUED BY
SAE

DATE
20.06.2019



PURCHASE SPECIFICATION
FOR 4.5kV 1200A IGBT

PS4062320

REV. NO: 00

PAGE : 01 OF 02

Introduction: BHEL EDN is manufacturing propulsion system for 6000HP AC LOCO used in Indian Railways. Power converters of these propulsion systems are build using 4500V 1200A IGBTs. Following are general specification of IGBT used for manufacture of power modules.

Description: Insulated Gate Bipolar Transistor (IGBT) module

COPYRIGHT AND CONFIDENTIAL.
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
 It must not be used directly or indirectly in any way detrimental to the interest of the company.

S.NO	Parameter	Value
1	Collector-emitter voltage VCES	4500V
2	DC collector current IC	1200A ¹ at Tc ≥ 80 °C
3	Peak collector current	2400A (min.)
4	Gate-emitter voltage VGES	± 20V (max.)
5	Isolation voltage Visol	7kV (min.)
6	Junction operating temperature Tvj(op)	125 deg. C (min.)
7	Collector-emitter saturation voltage VCEsat	4.5 V (typ.) at IC = 1200 A, Tvj = 125 °C
8	Short circuit pulse width tpSC	10µS at Tvj = 125 °C
9	Gate-emitter threshold voltage VGE(TO)	7.5 V (typ.)
10	Internal gate resistance Rgint	2 Ω (typ.)
11	Module stray inductance L CE	20nH (max.)
12	Emitter-collector voltage VEC	4 V (typ.) at IC = 1200 A, Tvj = 125 °C
13	switching energy loss Esw (Eon + Eoff)	11.5 J (typ.) *
14	Reverse recovery energy Erec	3.6 J (typ.) *

* Test condition: VCC ≥ 2600 V, IF = 1200 A, Tvj = 125 °C, VGE = ±15 V, Ls : 150 nH (typ.), inductive load



PURCHASE SPECIFICATION

PS4062320

REV. NO: 00

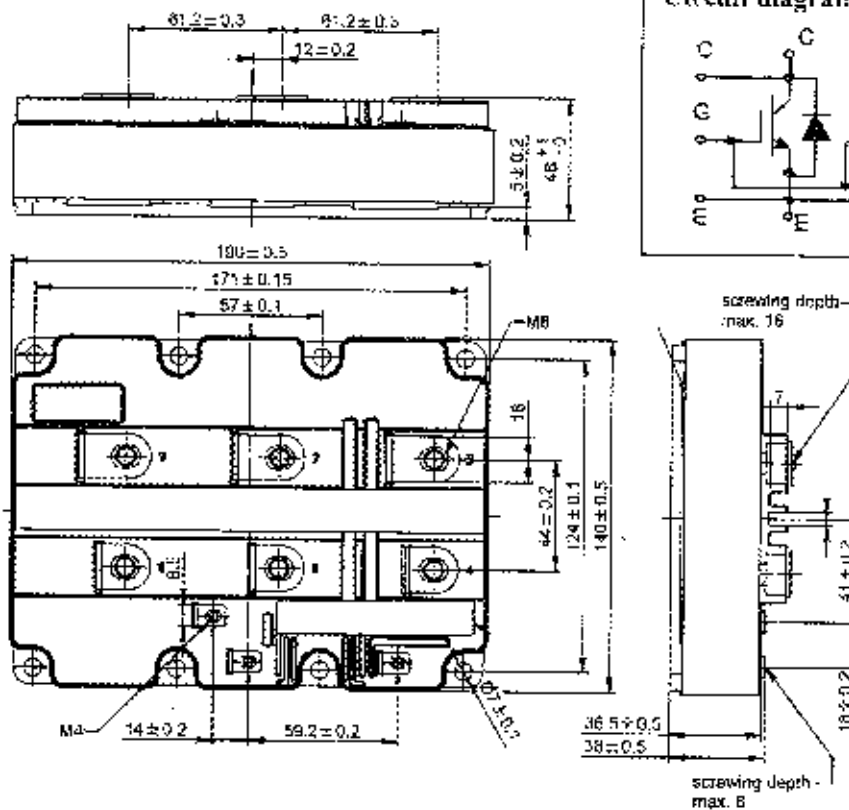
FOR 4.5kV 1200A IGBT

PAGE 02 OF 02

- | | | |
|----|--|---|
| 15 | IGBT thermal resistance junction to case
Rth(j-c)IGBT | 11 K/kW (max.) |
| 16 | Diode thermal resistance junction to case
Rth(j-c)DIODE | 20 K/kW (max.) |
| 17 | Contact thermal resistance case to heatsink
Rth(c-h) | 7 K/kW (max.) |
| 18 | Mass | 2 Kg (max.) |
| 19 | Dimensions | 190x140 mm. For detailed dimensions refer below drawing |

COPYRIGHT AND CONFIDENTIAL
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
 It must not be used directly or indirectly in any way detrimental to the interest of the company.

Outline drawing (for dimensional purpose only)



Acceptance Criteria: Accepted based on Test report / COC.

---END---

Additional terms and conditions Rev01

1. This RFQ is for entering into Rate contract (RC) with BHEL for the tendered item. Validity of the RC will be 12 months from the award of rate contract (LOI). Firm orders will be placed during the tenure of rate contract. Prices will remain firm till the validity of RC or till the completion of supplies against the purchase orders placed against this rate contract whichever later. May please note that these quantities are projections based on the current business scenario and expected orders from customers. In the eventuality of business not coming through, BHEL is not obligated to exhaust the ordering of RC quantities.
2. Quantity indicated in the RFQ is tentative based on BHEL' S projected requirement over the next one year. Purchase orders shall be placed as and when actual requirements arise during the tenure of this rate contract.
3. BHEL reserves the right of postponement, rescheduling or staggering of delivery based on the BHEL delivery Schedule.
4. Rates and other terms and conditions agreed upon shall remain firm till the completion of tenure of rate contract or till completion of supplies against purchase orders placed under rate contract, whichever is later.
5. PO shall be placed from time to time depending on actual requirement of BHEL during the tenure of the contract
6. Validity of the offer shall be for 90 days for issue of LOI.
7. In the event of not accepting for Rate contract terms, your offer will be liable for rejection.
8. If any conditions not acceptable shall be mentioned exclusively. Otherwise it will be treated as all conditions are acceptable to the bidder.

Annexure-I

Additional terms for Order Splitting

Order Splitting: BHEL reserve the right to Split the rate contract quantity in the ratio of 70:30 to L1, and L2 Bidders respectively subjected to L2 Bidder accept to supply as per L1 negotiated price. In case, L2 Bidder does not accept to supply as per L1 negotiated price, the counter offer will be extended to subsequent Bidder's i.e. L3, L4, L5.... In case no subsequent Bidder accept to supply at L1 price, balance quantity will be ordered on L1 only. The decision of BHEL shall be final on this matter.

In case of single qualified bidder 100% quantity will be order on L1.

Annexure-II

Formula to incorporate Exchange rate variation clause (ERV):

Considering:

Rate quoted in INR in the offer is **A**

Exchange Rate of foreign currency to INR in the offer is **B**

Exchange rate of foreign currency to INR on part-I bid opening date is C

For calculation of comparison statement (CS) after price bid opening: Exchange rate of SBI card rate on the **date of Part-I Bid opening** will be considered.

1) Formula to derive unit rate in INR for comparison statement (CS) with ERV clause:

INR Rate = *Rate quoted in INR in the offer (A) X Exchange rate of foreign currency to INR on part-I bid opening date (C) / Exchange Rate of foreign currency to INR quoted in offer (B)*

2) After Ordering, formula to derive unit rate in INR for calculating Invoice value as per ERV clause:

Date of Invoice will be considered for rate of exchange as per SBI card rate. Suppose Exchange rate to INR of foreign currency on date of Invoice is **D ****.

INR rate = *Rate quoted in INR in the offer (A) X Exchange rate of foreign currency to INR on date of Invoice (D) / Exchange Rate of foreign currency to INR quoted in offer (B)*

(** In Case of delays deliveries, Exchange rate (SBI TT Selling rate) on actual delivery or Exchange rate (SBI TT Selling rate) on schedule delivery date, whichever is lower will be considered. In Case of deliveries before scheduled delivery date, Exchange rate (SBI TT Selling rate) on actual delivery date will be considered.

Delivery at EDN should happen within 10 days of Invoice, if delivery is delayed more than 10 days of invoice, exchange rate prevailing 10 days before actual delivery date will be considered)

RFQ TERMS & CONDITION

Following points are to be noted before submitting your offer.

1- Important Notice: Request you to go through terms and conditions before submitting quote.

a) INSTRUCTIONS TO BIDDERS/SELLERS (**Doc No :BHEL:EDN:ITB-SHOP: Rev 03**) available at <http://edn.bhel.com> (RFQ-PO Terms & Conditions)

b) GENERAL CONDITIONS OF CONTRACT FOR PURCHASE (**Doc no: BHEL: EDN: GCC-SHOP: Rev 01**) available at <http://edn.bhel.com> (RFQ-PO Terms & Conditions)

c) Any other specific Terms and Conditions mentioned.

d) **FOR THIS PROCUREMENT, PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA)**, Order 2017 dated 15.06.2017, 28.05.2018 and revision dated 16th September 2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/or local content in respect of this procurement, same shall be applicable.

<https://dipp.gov.in/public-procurements>

e) **FOR THIS PROCUREMENT (GFR)**, Restrictions under Rule 144(xi) of the General Financial Rules (GFRs), 2017- Dept. of Expenditure OM No.6/18/2019-PPD dated 23rd July, 2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO against this NIT.

<https://www.mea.gov.in/>

f) **PURCHASE PREFERENCE FOR MSE VENDORS:**

MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 25% of the requirement against this tender provided: -

- i. The MSE vendor matches the L1 price. ii. L1 price is from a non MSE vendor.
- iii. L1 price will be offered to the vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2), next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
- iv. 3% of the 25% will be earmarked for women owned MSEs.
- v. 25% of the 25% (i.e., 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (i) & (ii) are fulfilled.
- vi. In case where no SC/ST category firms are meeting the conditions mentioned in (i) and (ii) or have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender.
- vii. In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items/quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc., then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1. Such information that tendered quantity will not be split shall be indicated in the RFQ.

- 2- Bidders should mention GSTN number of the place of supply and HSN (Harmonized System of Nomenclature)/SAC (Services Accounting Code) number in the offer. In case both supply and service are involved, GSTN no of the place of supply for services shall also be mentioned separately in the offer if different.
- 3- This is TWO PART BID tender. BIDDERS are requested to send "Techno Commercial Bid" AND "Price BID" separately. For more details, please refer point 2.b in attached RFQ Terms and conditions document
- 4- Penalty for delayed delivery is applicable for this Enquiry. If it is not mentioned explicitly it will be assumed as acceptance.
- 5- Offers with ADVANCE PAYMENT are liable for rejection
- 6- If only "Sight Draft" is mentioned it will be considered as "Sight Draft with 45 days"
- 7- In case of not interested in submitting quotation, please send the regret letter which is essential for our records.
- 8- Please indicate complete part number in your quotation and make, else your quotation might be rejected.
- 9- ***Please quote for our RFQ quantity and for MOQ (if any). Offers with high MOQ may not be accepted.***
- 10- Material has to be supplied in manufacturer's pack in sealed condition (Refurbished/ pulled out parts are not accepted).
- 11- Supplier should quote online. Quotation received in hardcopy will not be considered.
- 12- If we find different prices for the same Mat Code (after opening Price BID), we will consider the Lowest price only (out of all different prices) for the entire quantity.
- 13- Documents Required from Foreign Bidders: -
 - I - Documents needed for consignments to be picked**
 1. Airfreight request format.
 2. Invoice
 3. Packing list
 4. PO copy
 - II - Documents to be submitted to SBI & Soft copy of the same to be shared to concerned purchase officer,**
 1. Covering letter
 2. Invoice
 3. Packing list
 4. AWB
 - III - Tax compliance documents – Every Financial Year.**
 1. Form 10F – shall be furnished electronically and shall be verified in the manner prescribed under sub-rule (1) of Rule 131
 2. No PE/BC
 3. Tax Residency Certificate (TRC)

-----END-----

Tender Terms - Conflict of interest

"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) they have controlling partner (s) in common; or
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or
- c) they have the same legal representative/agent for purposes of this bid; or
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, · or
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; or
- f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
 - 1. The principal manufacturer directly or through one Indian agent on his behalf; and
 - 2. Indian/foreign agent on behalf of only one principal, or
- g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid, · or
- h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. "

COMMERCIAL TERMS & CONDITIONS

To be mandatory filled in <i>YES/No</i> or Not applicable (<i>NA</i>)		(YES/No/NA)	Remarks (if, any)
1	Payment terms: (For any deviation Loading factor will be applicable above the quoted rate)		
1.A	For Quote in INR: BHEL standard payment terms is <u>100% within 45 days credit</u> :		
1.B	For Quote in other than INR: BHEL standard payment terms is <u>100% against sight draft with 45 days credit</u>		
2	Delivery Terms:		
2.A	For Quote in INR: Delivery Terms: BHEL Standard delivery is <u>BHEL DDL-EDN BANGALORE</u> :		
2.B	For Quote in other than INR: (Vendor to mention INCO Terms like FCA/EX-Works)		
3	Penalty terms for Delayed Delivery: 10% loading factor for not accepting the penalty.		
3.1	BHEL standard Penalty Terms is accepted for delayed delivery		
4	Currency of offer: Please specify the currency of your offer		
5	Country of origin: Please specify country of origin.		
6	Offer validity: 90 Days		
7	Delivery Schedule required by BHEL: BHEL requires BEST delivery Schedule from the date of PO. If Staggered, Lot size & Delivery Schedule to mention.		
8	Price basis: Firm: For price quoted other than INR For Price quoted in INR: Exchange rate Variation clause is applicable as per annexure II Price to be quoted per IGBT.		
9	GFR Certificate attached		
10	MII Certificate attached		
11	Bank Account Details of Foreign suppliers		
12	Other terms & Conditions as per NIT		
13	Mention the Government E-Marketplace (GeM) Seller ID (Mandatory for placing PO worth Rs. 25 Lakhs & above) Applicable for only INDIAN VENDORS		

Note-1: REVERSE AUCTION:- REVERSE AUCTION IS NOT APPLICABLE FOR THIS TENDER.

Note-2: **MII certificate:** For this tender, Non-Local supplier whose local content is less than 20% are eligible to participate.
Purchase preference for MII will be given to class –I Local supplier.
Please refer GOI circular No. P-45021/2/2017-PP (BE-II) dtd. 16/09/2020 for detail of purchase preference.

Signature of Tenderer with Seal

Purchase Qualification Criteria (PQC) RFQ No. : SAMRC24007		
SUPPLIER NAME:-		
PQC		
Sl. No.	Description	Bidder's Confirmation. Attach relevant documents wherever required. (YES/NO)
1	The bidder shall be an Original equipment Manufacturer (OEM) of IGBT OR Bidder authorized by OEM of IGBT to be supported with valid authorization letter from OEM for supplies to Indian Region.	
2	Offer shall be for new IGBT and not for any used or refurbished item.	
3A	The bidder shall be the supplier of IGBTs rated for 4.5 kV 1200 A for usage in traction converters of propulsion system. Bidder shall supply IGBTs as per BHEL's Purchase Specification No. PS 4062320 Rev No: 00 dated 20.06.2019, which is approved for series production by Indian railways and also proven in BHEL make propulsion system.	
3B	Bidders who are not meeting the criteria as in "3.A" above, will not qualify in techno commercial Bid (Part –I Bid) and their price Bid (Part II Bid) will not be opened. For such offers BHEL shall pre evaluate and approach RDSO/Indian Railways with details furnished by the bidder along with their offers for approval. The bidder shall also co-ordinate and provide all the necessary documents to Indian Railways /RDSO as required. These bidders will be considered only for a development order of 1 set = 80 Nos. of IGBTs. Bidder shall supply these IGBTs at L1 price as finalized in this tender. Further BHEL will take up with Indian Railways/ RDSO for evaluation and obtaining necessary approval for regular use in BHEL make propulsion system.	
4	Document Submission. a) Bidder to submit compliance to purchase Specification No. PS 4062320 Rev No: 00 dated 20.06.2019 along with data sheet. Bidder who are not meeting the criteria as mentioned in Point No. 3.A shall submit following documents:- b) Proof of Supply of this or higher rating IGBTs used in rolling stock application directly or through any agency to Indian Railways to be submitted for reference. c) Type test report along with data sheet for proposed IGBT with clause wise compliance.	

Signature of Tenderer with Seal

On Bidder Letter Head

Date:

To,

M/s Bharat Heavy Electricals Ltd.
Electronics Division, Mysore Road,
Bangalore – 560026

Sub: Model Clause / Certificate as per Annex-III (Tenders) of Restrictions Under Rule 144 (xi) of the General Financial Rules (GFRs) 2017, Dated 23.07.2020.

Ref: BHEL Tender / RFQ / NIT Number

I..... **[Write name of Authorized person]**
Authorized signatory for M/s **[Write Company Name]** have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India , we certify that this bidder M/s**[Vendor Name & address]** is not from such a country or , if from such a country **[Tick appropriate option & cut the other one]**, has been registered with the competent authority . We hereby certify that we fulfill all requirements in this regard and is eligible to be considered **[attach evidence of valid registration certificate with competent authority]**.

For M/s

Authorized Signatory
(with company seal & Name)

On Bidder Letter Head

Date:

To,

M/s Bharat Heavy Electricals Ltd.
Electronics Division, Mysore Road,
Bangalore – 560026

Sub: Model Clause / Certificate as per clause 9 (a) of Revised Public Procurement (Preference to Make in India Order, 2017 of DPIIT dated 13.06.2020.

Ref: BHEL Tender / RFQ / NIT Number

I..... (authorized signatory for M/s) a 'Class-I Local Supplier' / 'Class-II Local Supplier' at the time of tender, bidding or solicitation hereby confirm that the item meets the Local Content requirement for 'Class-I Local Supplier' / 'Class-II Local Supplier' (Tick appropriate option & cut the other one) and the Local Content percentage is

The address is as below, where the local content / value addition is made:

[Factory Address]

For M/s

Authorized Signatory
(with company seal & Name)