



REQUEST FOR QUOTATION

	BHARAT HEAVY ELECTRICALS LIMITED Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 INDIA	RFQ NUMBER: SSMOT22004 RFQ DATE : 15.09.2022	
MMI:PU:RF:003			
(address for communication) :		(for all correspondence)	
		Purchase Executive : SANJOY SAM Phone : 08026998055 Fax : E-mail: sanjoy.sam@bhel.in	

SI No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	DV0688173349 IGBT 4500V 1500A * HSN/SAC : 8541 Mfr Part No.- CM1500HG-90X Vendor - MITSUBISHI CORPORATION IGBT 4500V 1500A	164	NO	164	10.01.2023

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. SANJOY SAM Sub-Assembly 1 OF 1
--	--



**PURCHASE SPECIFICATION
FOR 4500V 1500A IGBT**

PS4062377

REV. NO: 00

PAGE : 00 OF 02

SPECIFICATION FOR 4500V 1500A 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 anyway detrimental to the interest of the company

REV. NO.	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	23.02.2022	FIRST ISSUE	-----	Hari Kalluru <i>K. Hari</i>	T J GIRISH <i>T. J. Girish</i>

APPROVED BY	T J GIRISH <i>T. J. Girish</i>	
PREPARED BY	ISSUED BY	DATE
Hari Kalluru	SAE	23.02.2022



PURCHASE SPECIFICATION

PS4062377

REV. NO: 00

FOR 4500V 1500A IGBT

PAGE : 01 OF 02

Introduction: BHEL EDN is manufacturing propulsion system for ACLOCO used in Indian Railways. Power converters of these propulsion systems are build using 4500V 1500A IGBTs. Following are general specification of IGBT used for manufacture of power modules.

Description: Insulated Gate Bipolar Transistor (IGBT) module

S.NO	Parameter	Value
1	Collector-emitter voltage VCES	4500V
2	DC collector current IC	1500A at Tc ≥ 85 °C
3	Peak collector current	3000A (min.)
4	Gate-emitter voltage VGES	± 20V
5	Isolation voltage Visol	10200V (min.)
6	Junction operating temperature Tvj(op)	150 deg. C
7	Collector-emitter saturation voltage VCEsat	4.4 V (typ.) at IC = 1500 A, Tvj = 150 °C
8	Short circuit pulse width tpSC	10µS at Tvj = 150 °C
9	Gate-emitter threshold voltage VGE(TO)	7 V (typ.)
10	Module stray inductance L CE	18nH (typ.)
11	Emitter-collector voltage VEC	3.2 V (typ.) at IC = 1500 A, Tvj = 150 °C
12	switching energy loss Esw (Eon + Eoff)	15 J (typ.) *
13	Reverse recovery energy Erec	5.7 J (typ.) *

* Test condition: VCC ≥ 2800 V, IF = 1500 A, Tvj = 150 °C, VGE = ±15 V, Ls : 150 nH (typ.), inductive load



PURCHASE SPECIFICATION

PS4062377

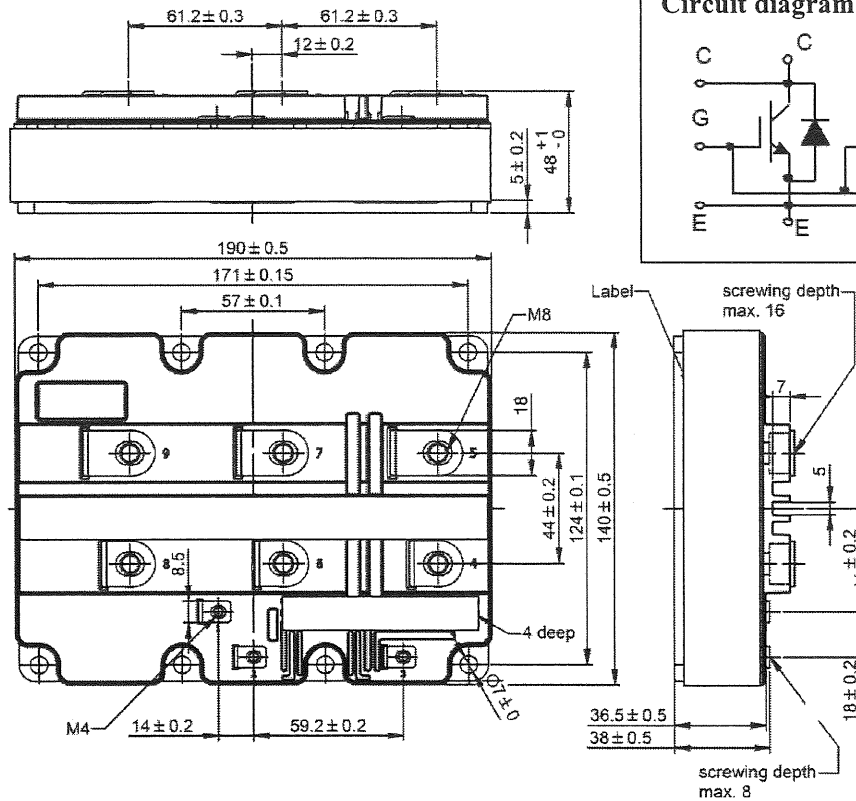
REV. NO: 00

FOR 4500V 1500A IGBT

PAGE : 02 OF 02

14	IGBT thermal resistance junction to case Rth(j-c)IGBT	10 K/kW (max.)
15	Diode thermal resistance junction to case Rth(j-c)DIODE	16 K/kW (max.)
16	Mass	2 Kg (max.)
17	Dimensions	190x140 mm. For detailed dimensions refer below drawing

Outline drawing (for dimensional purpose only)



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.

Documents to be supplied during technical bid:

Supplier shall furnish clause wise confirmation/comments to the technical specification. Deviation, if any, shall be clearly brought out indicating the clause number, original specification, deviation sought with proper technical backup (catalogue/technical brochure). Detailed data sheet

Acceptance Criteria: Accepted based on Test certificate/ report.



PRE QUALIFICATION CRITERIA

PQC : 406-OT-2

PAGE 01 OF 02

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 anyway detrimental to the interest of the company.

Sl. No.	CRITERIA	DOCUMENT REQUIRED
1	The bidder should be Original Equipment Manufacturer (OEM) / Authorised Distributor of OEM / General dealer. General Dealer should procure the item directly either from Authorized Distributor or OEM	
2	Documents to be submitted along with technical Bid	
2.1	OEM	-
2.2	Authorised Distributor	Proof of Authorisation.
2.3	General dealers:	Compliance to point 3.3 should be clearly stated in the Offer.
3	Documents to be submitted during material supply:	
3.1	OEM	Certificate of Conformance
3.2	Authorised Distributor	OEM/ Distributor COC
3.3	General dealers:	1) OEM / Authorised Distributor /Dealer COC. 2) Certificate on vendor's letter head certifying procurement from OEM/Authorised Distributor.

REVISION : 00

APPROVED BY
Sudha Iyengar S
AGM/SAE

PREPARED BY
GIRISH T J
AGM/SAE

ISSUED

DATE
01/08/2022



PRE QUALIFICATION CRITERIA

PQC : 406-OT-2

PAGE 02 OF 02

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 anyway detrimental to the interest of the company.

Sl. No.	CRITERIA	DOCUMENT REQUIRED
4	The supplier shall offer item as per purchase specification. If there are any queries regarding specification, it is supplier's responsibility to get the same clarified from the purchaser before submitting the offer. Wherever OEM packing is specified, Vendor shall supply in multiples of SPQ.	
5	In case of rejection during usage of item in production, Vendors shall support for replacement at BHEL EDN and failure analysis in case of quality issues at their own cost within 2 weeks from date of intimation or mutually agreed period.	

REVISION : 00

APPROVED BY

Sudha lyengar S
AGM/SAE

PREPARED BY
GIRISH T J
AGM/SAE

ISSUED

DATE
01/08/2022

Only Class-I Local supplier and Class-II local supplier are eligible to bid for this RFQ.

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 and eligibility for participating in this RFQ.

Reverse Auction will be conducted for this RFQ

Reverse Auction will be conducted if two or more bidders are techno commercially qualified. In case of two or three qualified bidders, there shall be no elimination of H1 bidder (whose quote is highest in sealed envelope price bid). In case of four qualified bidders, the H1 bidder shall be eliminated whereas in case of five qualified bidders, H1 & H2 bidders shall be eliminated. However, in case of six or more qualified bidders are available, RA would be conducted amongst first 50% of the bidders arranged in the order of prices from lowest to highest. Number of bidders eligible for participating in RA would be rounded off to next higher integer value if number of qualified bidders is odd (e.g. if 7 bids are qualified, then RA will be conducted amongst lowest four bidders). However, there will be no elimination of qualified bidders who are MSE or qualifying under PPP-MII, Order 2017, irrespective of the number of bidders qualifying techno-commercially. In case of multiple H1 bidders, all H1 bidders (excluding MSEs and bidders qualifying under PPP-MII, Order 2017) shall be removed provided minimum two bidders remain in fray, else no H1 removal.

The lowest bidder in sealed envelope price bid shall be shown as current L1 automatically by the system. System shall have the provision to indicate this bid as current L1 for further bidding. This price can be displaced by an even lower bid of a competing bidder.

If the start price is lower than the lowest sealed envelope price bid on acceptance of such start price by any bidder this bid would be indicated as current L1 for further bidding. However, if no bidder accepts the start price, RA shall be treated as cancelled for the respective line item(s) and the tender shall be processed accordingly. In case of no further bidding, RA will be deemed to have been successful with current L1 bidder. During RA, all bidders will see their rank and current L1 price on the screen. Once the RA is done, the ranking status would be based on the last quoted price of the bidder(s) irrespective of the quote received in RA or sealed envelope price bid.

No bidder shall be allowed to lower its bid below the current L1 by more than 5 decrements at one go.

Following are points to be noted before submitting your offer.

1) Important Notice: Our Terms and Conditions and Various loading factors are revised and please go through documents available at www.bheledn.com. Request you to go through before submitting quote.

a) INSTRUCTIONS TO BIDDERS/SELLERS (Doc No :BHEL:EDN:ITB-SHOP: Rev 03) available www.bhel.com (RFQ-PO Terms & Conditions) b) GENERAL CONDITIONS OF CONTRACT FOR PURCHASE (Doc no: BHEL: EDN: GCC-SHOP: Rev 01) available at www.bhel.com (https://web-edn.bhel.com/en_service/vendorinfo/Terms.pdf) c) Any other specific Terms and Conditions mentioned.

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)

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) 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

1. The MSE vendor matches the L1 price.

2. L1 price is from a non MSE vendor.

3. 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).

4. 3% of the 25% will be earmarked for women owned MSEs.

5. 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 (1) & (2) are fulfilled.

6. In case where no SC/ST category firms are meeting the conditions mentioned in (1) and (2) 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.

7. 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

13) PURCHASE PREFERENCE FOR MAKE IN INDIA VENDORS

Purchase preference for MII will be given to class –I Local supplier (Local content 50% and more). Please refer GOI circular No. P-45021/2/2017-PP (BE-II) dtd. 16/09/2020 for detail of purchase preference and eligibility for participating in this RFQ

For all correspondence, contact

Mr. Sanjoy Sam,
Phone 080 2699 8055,
E-mail: Sanjoy.sam@bhel.in

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 (authorized signatory for M/s) 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 , 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)