

*Maulana Azad*

**National Institute of Technology Bhopal- 462 003**

(An Institution of National Importance under MHRD, Govt. of India)



**LIMITED TENDER ENQUIRY  
FOR  
SUPPLY AND TESTING OF IGBT BASED POWER MODULES**

Website: [www.manit.ac.in](http://www.manit.ac.in)  
Email Address: [info@manit.ac.in](mailto:info@manit.ac.in)

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No. MANIT/EC/2019/709

Date:05/02/2019

**NOTICE INVITING TENDER**

**Sub: Supply and Testing of IGBT Based Power Modules.**

Tenders are invited for **Supply and Testing of IGBT Based Power Modules**. Interested Manufacturers/Authorized Partner/Agencies may log on Institute website [www.manit.ac.in](http://www.manit.ac.in) and CPPP website [www.eprocure.gov.in/epublish/app](http://www.eprocure.gov.in/epublish/app) for further details. Tender Document can be downloaded and the duly completed form to be submitted to the AR (Stores & Purchase) Maulana Azad National Institute of Technology- Bhopal- 462 003.

Last date of receipt of complete tender document is 27/02/2019 up to 12.00 hours. The Director of the Institute reserves the right to accept or reject any or the entire tender in full or in part without assigning any reason whatsoever.

**Registrar**

*Maulana Azad*

National Institute of Technology Bhopal- 462 003

<b>IMPORTANT INFORMATION AT A GLANCE</b>		
Tender No & Date	No. MANIT/EC/2019/ 709	
	Date: 05/02/2019	
<b>SCOPE OF TENDER</b>		
Brief Description of Goods/Items	Quantity	Remarks
<b>Supply and Testing of IGBT Based Power Modules</b>	<b>12</b>	Detailed Specification at Annexure-I
Estimated Cost of Tender	<b>Rs. 9,84,000.00</b>	
Location of Supplies	at Energy Centre	
<b>TENDER DOCUMENT</b>		
Tender Document can be downloaded free of cost from Institute website <a href="http://www.manit.ac.in">www.manit.ac.in</a> and CPPP website <a href="http://www.eprocure.gov.in/epublish/app">www.eprocure.gov.in/epublish/app</a>		
<b>Last Date &amp; Time of Submission of Tender</b>	<b>27/02/2019 up to 12:00 hours</b>	
<b>Date &amp; Time of Opening of Bids</b>	<b>27/02/2019 at 15:30 hours</b>	
<b>Expected Delivery Period</b>	<b>Twelve weeks from issuance of order</b>	
Details of Contact Persons for Query if any		
<b>Name: Dr. Arvind Mittal</b> <b>Designation:</b> Professor Tel No: 0755 4051255 Email: am1970nit@gmail.com	<b>Name: Dr. Amit Ojha</b> <b>Designation :</b> Assistant Professor Tel No: 0755 4051418 Email: ojha.amit@gmail.com	

## INSTRUCTIONS TO BIDDERS

1	<b>Scope of Supplies &amp; Work:</b>	
a	The Goods/ Items shall be supplied as per the specification & drawing mentioned in <b>ANNEXURE-I</b> .	
b	Where ISI certification marked goods are available in market, procurement should generally be limited to goods with those or equivalent marking only. The warranty/AMC required must be specified	
c	After the supply of Goods/ Items & Accessories as mentioned in the <b>ANNEXURE-I</b> , the bidder has to execute its installation at the designated location(s). No extra cost shall be paid for this reason.	
2	<b>Delivery of Supplies &amp; Installation:</b>	
a	The purchaser interested for complete delivery of Goods/items along with Installation by bidder within stipulated time limit.	
b	The material shall be inspected on receipt at site and bidder shall be responsible for any damage during the transit of Goods/Items.	
c	The insurance cover including insuring the goods against the loss or damage incidental to manufacture or acquisition, transportation, storage and delivery/ installation shall be obtained by bidder in his own name and not in the name of purchases.	
3	<b>Warranty &amp; After Sales Services:</b>	
a	The bidder shall offer on-site comprehensive warranty of Good/Items for 02 (Two) years from the date of successful commissioning of goods at the designated location & shall cover each and every part of the goods including parts having limited life etc. The purchaser is not liable to pay any extra charges on any account during warranty period.	
b	The bidder shall ensure to render after sales services during the warranty period to the satisfaction of purchaser.	
c	The performance Bank Guarantee 10% of the basic value is required for the warrantee period.	
4	<b>Eligibility Criteria:</b>	
a	Bidder should have minimum annual turnover (ten times of estimated cost of tender) in last year .CA certification in this regard is to be submitted.	
b	Bidder should have GST Number & PAN both.	
c	Bidder must have completed the Supply of IGBT Based Power Modules during last three years. Copy (s) of Work order must be submitted along with bid.	
5	<b>Amendment of Tender Document:</b>	
a	At any time prior to the date submission of bids, the purchaser, may, for any reason, whether at its own initiative or in response to a clarification sought by a prospective bidder, amend bid document by issuing corrigendum. The corrigendum will be notified/ published in e-tendering website <a href="http://www.eprocure.gov.in/epublish/app">www.eprocure.gov.in/epublish/app</a> and Institute website only.	
6	<b>Price Bid</b>	
a	The Prices should be quoted in Indian Rupees only as per <b>Annexure-II</b>	

b	Purchaser (being a research Institution) is registered with the Department of Scientific & Industrial Research (DSIR) for the purpose of availing custom duty exemption in terms of GoI Notification No. 51/96-Customs dated 23 July 1996. The bidder should quote their prices considering the exemption certificate. If any certification needed by bidder, may be given to avail this benefit.
c	Government of India, Ministry of Finance (Department of Revenue) Notification No: 47/2017 integrated Tax dated 14/11/2017, the NITs are exempted from GST in excess of the amount calculated at the rate of 5 per cent under the following categories: Scientific and technical Instruments, Apparatus, Equipment (including Computers); (a) Accessories, Parts, Consumables and live animals ( experimental purpose); (b) Computer Software, Compact Disc-Read only Memory (CD-ROM), recorded magnetic tapes, Microfilms, Microfiches; (c) Prototypes, the aggregate value of prototypes received by an institution does not exceed fifty thousand rupees in financial years.  The bidder should quote their prices considering the exemption. If any certification needed by bidder, may be given to avail this benefit
d	Bidder shall take into account all costs including unloading at the location of purchaser, cartage etc. for giving delivery of material at site(s) before quoting the rates. In this regard no claim what so ever shall be entertained.
e	The bidders are advised not to indicate any separate discount. Discount, if any, should be merged with the quoted unit prices.
f	The price quoted in price bid shall be firm but subject to change in rate of applicable taxes if any.
g	The Bidder should avoid the use of vague term such as “Extra as applicable”. Such offers shall be treated as non-responsive.
h	No extra payment shall be paid on account of any discrepancy in nomenclature of items. The bidder shall seek clarifications if any before submitting the tender.
7	<b>Bid Submission:</b>
	The tender must be placed in a properly sealed envelope super-scribed “ <b>Supply of IGBT Based Power Modules.</b> ” with tender inquiry number and its due date addressed to The Director, Maulana Azad National Institute of Technology- Bhopal- 462003 and must reach the office of <b>AR (Stores &amp; Purchase), Maulana Azad National Institute of Technology, Bhopal- 462003</b> by 27/02/2019 up to 12.00 hours. The sealed Envelope should be consisting of followings:
a	<b>INSTRUCTION TO BIDDERS</b> duly signed and accepted
b	<b>ANNEXURE-I</b> duly signed and accepted.
d	Copy of Certificate of Registration of Company/ firm/ Agency
e	Copy of valid GST Number & PAN both.
f	Certificate mentioning of Turnover for the last year.
g	Copy (s) of Work order in respect of Supply & Testing of IGBT based power modules during last three years.
h	The bidder would have to quote the prices for the total scope of work item wise in the <b>ANNEXURE-II</b> . Partial quote are liable to be rejected.

8	<b>Evaluation of Bids:</b>	
	The Institute shall evaluate all the items together or separately depending upon nature of items of circumstance and compare the quotations determined to be substantially responsive i.e. which	
	a	are properly signed;
	b	Confirm to the eligibility criteria of the vendor; and
	c	Confirm to the terms & conditions, and technical specifications.
9	<b>Validity of Tender:</b>	
	a	The tender shall be valid for a period of 60 days from the date of opening of the bid of tender. Terms and financial details submitted in the bid shall be treated as firm during the 60 days period.
	b	In exceptional circumstances, prior to the expiry of the bid validity period, the purchaser may request bidders to extend the period of validity of their bids. The request and the responses shall be made in writing.
10	<b>Notification of Award:</b>	
	a	Prior to the expiry of the period of bid validity, the purchaser shall notify the successful bidder, in writing, that its bid has been accepted. The notification letter shall specify the sum that the purchaser will pay to the bidder in consideration of the <b>Supply of Goods/ Items</b> .
11	<b>Penalty Clause:</b>	
	a	The bidder shall indicate the period within which the ordered quantity will be supplied along with Installation & Commissioning of Goods/ Items. The bidder shall note that in case bidder fails to do so within the period of delivery indicated by the bidder in bid of this tender, penalty @ 01% of value of the order per week of delay would be levied subject to maximum 10 weeks. It means, the bidder shall have the liability of delayed supply to the maximum of 10 weeks after expiry of scheduled delivery date.
12	<b>Terms of Payment:</b>	
	a	The Payment shall be made within 30 days by purchaser after supply and successful testing of Goods/ Items.
13	<b>Jurisdiction:</b>	
	a	In the event of any dispute the legal matter shall be subjected to the jurisdiction of Bhopal court only.
We confirm with our acceptance to the instructions (SI.No-1 to 13 above) as given above.		
Date:		BIDDER'S NAME & SIGNATURE WITH SEAL
<i>These duly signed "Instructions to the Bidders" as under shall be attached with bid of the tender as a mark of acceptance of bidder and any tender not confirming the instructions as under is liable to be rejected.</i>		

## ANNEXURE-I

## Maulana Azad National Institute of Technology Bhopal- 462 003

SN	Broad Specification of Goods/ Items	Qty	Unit
1	<p><b>IGBT BASED POWER MUDULE</b>            DC Voltage <math>V_{dc} = 600</math> V            Output AC Voltage <math>V_{ac} = 415</math> V            Output Current <math>I_{ac} = 30</math> A            Output Frequency = 50 Hz            Switching Frequency <math>F_{sw} = 20</math> kHz            Ambient Temperature <math>T_{amb} = 40</math> deg C.            Cooling Method Forced Air Cooled.</p> <p><b>IGBT Details</b>            V-IGBT=6. Generation Trench V-IGBT            CAL4= Soft switching 4 Generation CAL-diode.            Isolated copper baseplate using DCB technology (Direct Copper Bonding).            Increased power cycling capability.            With integrated gate resistor.            Low switching losses at high di/dt.</p> <p><b>Gate Driver</b>            It should interface and isolate the Control Unit/Primary Circuit from the secondary which is directly connected to the high power.            Gate Driver controls the IGBT's dynamic behavior and its short circuit protection.            Input signal level is 0/15V.            Interlocking time between the input signals is 3<math>\mu</math>s.            It should monitor the errors: power supply under-voltage (below 13 V), short-circuit between Collector and Emitter. The error reset time is typically 9<math>\mu</math>s.            On detection of error/fault, the Gate Driver switches off the IGBT.</p> <p><b>Snubber Circuit with suitable values of R &amp; C for protection of IGBT's</b></p> <p><b>Cooling</b>            Teaching kit stack assembly is provided with forced air cooling.            IGBT modules are mounted on 250 mm heat sink (extruded type).            Forced air-cooling is provided by Hi Cool Fan. 230VAC 1ph. should be applied to the Fan input terminals provided on the unit.            Flow of air is 3 m/s.            Input to the fan is 1-<math>\Phi</math>, 230 V Supply</p> <p><b>Thermal Protection</b>            Normally Closed Thermal contact switch is used for protection against thermal runaway.            The position of the thermal switch normally closed when its temperature is below the threshold temperature (80 deg C) &amp; it changes to normally open above 80 deg C.            After cooling down, it again retains it normally closed position.            Thermal switch is placed at the warmest point on the heat sink.</p>	12	Nos.
We confirm with our acceptance to the technical specification as given above.			
Date:		BIDDER'S NAME & SIGNATURE WITH SEAL	



### Power Module Requirement

#### Power Module Switch Rating:

Switch: IGBT

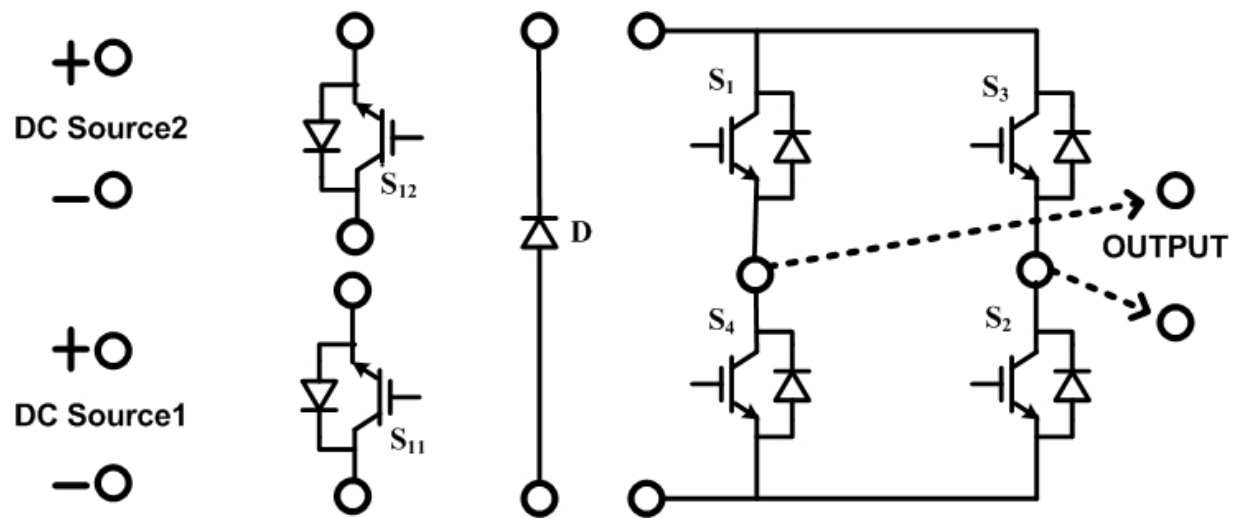


Fig.1. Module structure

Each module will consists of five power devices and one power diode.

Each switch rating: 600 V, 30 A.

Power diode: 600 V, 30 A.

**ANNEXURE- II**

**FORMAT FOR SUBMISSION OF BID PRICE**

To,	
The Director	
MANIT- Bhopal- 462 003	

Sub:	Price Bid with reference to Tender Document No: _____ dated _____
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SN	Product Description with make & Model	Discounted unit price	Qty	Qty Price	GST	Total Price
1	2	3	4	5	6	7(5+6)
1						
Total offered Price						
Total ( In Words)						

The followings things are confirmed and undertake by us that:	
a	The price quoted above are inclusive of basic price, statutory levies and taxes, duties, Transportation, Incidental services (including Insurance, Loading/ unloading, Packing & Forwarding charges, Installation etc.) at site.
b	Taxes are subject to change/ revision.
c	Offer price shall be valid for a period of 60 days from the date of opening of bid of this tender.
d	We will be agreed to offer services for on-site comprehensive warranty on the Goods/ Items supplied through this tender for two (02) years.
e	We agree with the terms and conditions specified in "Instructions to Bidders" and if selected, the execution of supplies would be made in compliance.
Date:	Signature of Authorized Bidder with proper rubber stamp
	Name:
	Designation:
	Mobile No: