

AlGaIn/GaN HEMT d-mode Wafers

NOTICE INVITING DOMESTIC TENDER



Department of Electronic Systems Engineering,
Indian Institute of Science, Bangalore

January 21, 2025

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1. Bid Schedule

1	Tender No	DESE/LU/MSA/23/2024-25
2	Tender Date	21-Jan-2025
3	Item Description	AlGaIn/GaN HEMT d-mode Wafers
	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	The Chairman, Department of Electronic Systems Engineering Indian Institute of Science, Bangalore -560012
6	Last Date & Time for submission of tender	12-Feb-2025, 2 PM.
7	For further clarification	Prof. Mayank Shrivastava Professor Department of Electronic Systems Engineering Indian Institute of Science, Bangalore, Karnataka 560012, India Secretary (Ms. Rekha's) Contact: 9972525771 (On Behalf of Purchase Committee) Email: msdlab.ese@iisc.ac.in (for tender related queries)

2. Eligibility Criteria

Prequalification criteria:

1. The Bidder should belong to either class 1 or class 2 supplier distinguished by their “local content” as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter.
 - a. Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
 - b. Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.)
2. Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to Class-1 supplier.
3. MSME can seek exemption to some qualification criteria. IISc follows GFR2017 for such details
4. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per - Annexure 4.
5. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.
6. Original Invoice must be provided for all items at the time of delivery. These documents should verify the authenticity, licensing, and quality assurance of items being supplied.
7. A comprehensive System Catalogue should be provided with the Technical Bid, detailing the item’s features, capabilities, and any other relevant technical information. This catalogue should give a clear overview of the item’s functionalities and help evaluate its suitability for the intended use.
8. Bidder shall have to submit audited accounts (Balance sheet profit and loss account) of last three financial years. Audited statements must be signed and stamped by a qualified chartered accountant.
9. Bidder must submit Income Tax return for last three financial assessment years.
10. Bidder must submit up to date sales tax or GST clearance certificate.
11. Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.

Vendor Eligibility Criteria:

1. Sales Confirmation: The vendor company should provide comprehensive details regarding their supply of the same **AlGaIn/GaN HEMT d-mode Wafers** in the last 5 years in India for multinational companies/PSUs/government organizations. The vendor should have sold the similar item to at least 3 entities as depicted above in last 5 years in India. Furthermore, they must substantiate their claims by furnishing relevant supporting documents.

3. Terms and Conditions

A) Submission of Tender:

1. All documentations in the tender should be in English.
2. Tender should be submitted in two envelopes (two bid system).
 - a. Technical Bid (Part-A) – Technical bid consisting of all technical details and check list for conformance to technical specifications.

The technical proposal should contain a technical compliance table with 5 columns.

 - I. The first column must list the technical requirements, in the order that they are given in the technical requirement below.
 - II. The second column should provide specifications of the instrument against the requirement. Please provide quantitative responses wherever possible with technical details in annexure.
 - III. The third column should describe your compliance with a “Yes” or “No” only. Ensure that the entries in column 2 and column 3 are consistent.
 - IV. The fourth column should state the reasons/explanations/context for deviations, if any.
 - V. The fifth column can contain additional remarks from the OEM. You can use this opportunity to highlight technical features, qualify response of previous columns, or provide additional details.
 - b. Commercial Bid (Part-B) – Indicating item wise price for the items mentioned in the technical bid, **as per the format of quotation provided in tender**, and other commercial terms and conditions.
 3. The technical bid and price bid should each be placed in separate sealed covers, superscripting on both the envelopes the tender no. and the due date. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly superscripted with the Tender No, Tender Description & Due Date.
 4. The SEALED COVER superscripting tender number / due date & should reach Chairperson Office, Materials Engineering, Indian Institute of Science, Bangalore – 560012, India on or before due date mentioned in the tender notice. In case due date happens to be holiday the tender will be accepted and opened on the next working day. If the quotation cover is not sealed, it will be rejected.

All queries are to be addressed to the person identified in “Section 1 – Bid Schedule” of the tender notice.
5. The price must be quoted in INR (Indian Rupee). Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
6. The quotations should be on FOR-IISc Bangalore basis in INR only.
7. The Institute reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time prior to the award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders.
8. Incomplete bids will be summarily rejected.

B) Cancellation of Tender:

Notwithstanding anything specified in this tender document, IISc Bangalore, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

- a. To accept OR reject lowest tender or any other tender or all the tenders.
- b. To accept any tender in full or in part.
- c. To reject the tender, offer not conforming to the tender terms.

C) Validity of the Offer:

The offer shall be valid at least 90 Days from the date of opening of the commercial bid.

D) Evaluation of Offer:

1. The technical bid (Part A) will be opened first and evaluated.
2. Bidders meeting the required eligibility criteria as stated in Section 2 of this document shall only be considered for Commercial Bid (Part B) opening. Further, agencies not furnishing the documentary evidence as required will not be considered.
3. Pre- qualification of the bidders shall not imply final acceptance of the Commercial Bid. The agency may be rejected at any point during technical evaluation or during commercial evaluation. The decision in regard to acceptance and / or rejection of any offer in part or full shall be the sole discretion of IISc Bangalore, and decision in this regard shall be binding on the bidders.
4. The award of contract will be subject to acceptance of the terms and conditions stated in this tender.
5. Any offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:
 - a. Non-submission of complete offers.
 - b. Receipt of bids after due date and time and or by email / fax (unless specified otherwise)
 - c. Receipt of bids in open conditions.
6. In case any BIDDER is silent on any clauses mentioned in these tender documents, IISc Bangalore shall consider that the BIDDER had accepted the clauses as of the tender and no further claim will be entertained. Further if the BIDDER is silent or does not give detail justification of their claim regarding those mentioned in technical specifications, IISc Bangalore reserves the full right to reject the tender due to non-compliance without any further discussion.
7. No revision in the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.
8. Lowest bid will be calculated based on the total price of all items tendered for Basic item along with accessories operation, preprocessing and post processing, optional items, recommended spares, warranty.

E) Pre-requisites:

The bidder will provide the prerequisite **AlGaIn/GaN HEMT d-mode Wafers**.

F) Warranty:

If the item is found to be defective, it must be replaced at the cost of the bidder within 30 days of receiving written notification from IISc, Bangalore. In the event of any delay in the repair or replacement, the warranty period will be extended by a corresponding amount of time to account for the downtime.

G) Purchase Order:

1. The order will be placed on the bidder whose bid is accepted by IISc based on the terms & conditions mentioned in the tender document.
2. The quantity of the items in tender is only indicative. IISc, Bangalore reserves the right to increase /decrease the quantity of the items depending on the requirement.
3. If the quality of the item and service provided is not found satisfactory, IISc, Bangalore reserves the right to cancel or amend the contract.

H) Delivery, Installation and Training:

The bidder shall provide the lead time to delivery, and made functional at IISc, Bangalore from the date of receipt of purchase order. The item should be delivered and made functional **within 180 days** from the date of receipt of purchase order. After successful delivery and inspection, the date of taking over of entire system by the IISc, Bangalore shall be taken as the start of the warranty period. No partial shipment is allowed. The vendor should be flexible with parts delivery. We may spread the entire requirement into 3 years and ask for delivery in lots of 25 wafers (Example: Year 1: 25 e-mode Wafers + 25 d-mode Wafers, Year 2: 50 e-mode Wafers and Year 3: 75 e-mode Wafers). IISc will help FedEx to take care of the customs clearance at Bangalore Airport. Please include your payment option. IISc would prefer payment after receipt of Wafers (in 30 days).

I) Payment Terms:

100% payments will be released after completion of delivery subject to TDS as per rules. AMC cost (if ordered), after completion of warranty period) will be released on half - yearly basis at the end of each six months subject to satisfactory services. The AMC will be comprehensive. Price basis must be on FOR-IISc Bangalore basis only. As per GFR, no advance payment can be made to domestic vendors unless an equal amount of bank guarantee is provided.

J) Statutory Variation:

Any statutory increase in the taxes and duties subsequent to bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc Bangalore subject to the claim being supported by documentary evidence. However, if any decrease takes place the advantage will have to be passed onto IISc, Bangalore.

K) Disputes and Jurisdiction:

Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore, India.

L) General:

1. All amendments, time extension, clarifications etc., within the period of submission of the tender will be communicated electronically. No extension in the bid due date/time shall be considered on account of delay in receipt of any document(s) by mail.
2. The bidder may furnish any additional information, which is necessary to establish capabilities to successfully complete the envisaged work. It is however, advised not to furnish superfluous information.
3. The bidder may visit the site before submission of tender, with prior intimation.
4. Any information furnished by the bidder found to be incorrect, either immediately or at a later date, would render the bidder liable to be debarred from tendering/taking up of work in IISc, Bangalore.



Indian Institute of Science Bangalore

Prof. Mayank Shrivastava
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Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

4. Technical Specifications

1. Following are the major items required (see detailed specs below):

1. d-mode GaN Wafers: 20 Nos.

Layer Specifications:

Layer name	Description	Thickness target	Comment
Substrate	150-mm Si/SiC substrate (111)	1000 μ m or higher	Preferred is Semi-insulating SiC
Buffer	Buffer	1.5 μ m	Vertical breakdown data should be provided
GaN channel	GaN	150 nm	Vendor should be able to customize based on our design requirement
Barrier	d-mode: AlGa _{0.25} N (25% Al)	d-mode: 22nm	Vendor should be able to customize (In, Al) N barriers on request based on our design requirement
Cap layer	d-mode: SiN	d-mode: up to 50nm SiN	Vendor should be able to customize thicknesses based on design requirements

Material Specifications

Parameter	Measurement	Units	Target
Barrier thickness	X-Ray	nm	$\pm 10\%$ or less
Barrier composition	Photoluminescence, ellipsometry	%	$\pm 1\%$ or better
Cap thickness	X-Ray	nm	$\pm 10\%$ or less
Wafer bow	Laser profilometer	μ m	± 50 max.
Edge exclusion		mm	5



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Electrical Specifications

Parameter	Measurement	Units	Target
Electron mobility*	Hall	cm ² /V.s	d-mode: > 1800 (for 20nm AlGa _{0.25} N, 25% Al)
Sheet charge density*	Hall	/cm ²	d-mode: > 9e12
Sheet resistivity*	Eddy current	Ohms/sq	d-mode: < 400
Vertical breakdown voltage*	Qualified 400V (long term stress qualified)	V	> 1000
Lateral breakdown voltage* (L _{G-D} > 20 μm)	Qualified 400V (long term stress qualified)	V	> 1200
Leakage current* (lateral, grounded substrate)	@400V, RT	nA/mm	< 100
Leakage current* (vertical)	@400V, RT	μA/mm ²	< 1

Technical Bid

The technical bid should furnish all requirements of the tender along with all annexures in this section and submitted to

The Chairman,
Department of Electronic Systems Engineering
Indian Institute of Science, Bangalore – 560012



Indian Institute of Science Bangalore

Prof. Mayank Shrivastava
Professor
Department of Electronic Systems Engineering
Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

Annexure-1

Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Details of the Bidder

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name
Designation, Seal

Date:



Indian Institute of Science Bangalore

Prof. Mayank Shrivastava
Professor
Department of Electronic Systems Engineering
Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

Annexure-2

Declaration regarding experience
To,
The Chairman,
Department of Electronic Systems
Engineering Indian Institute of
Science, Bangalore – 560012

Ref: Tender No:
XXXXXXXXXX Dated: XXXXX

AlGaIn/GaN HEMT d-mode Wafers

Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has XXXXXX years of experience in Supplying **AlGaIn/GaN HEMT d-mode Wafers.**

Yours faithfully
(Signature of the Bidder)
Printed Name, Designation, Seal

Date:



Indian Institute of Science Bangalore

Prof. Mayank Shrivastava
Professor
Department of Electronic Systems Engineering
Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

Annexure-3

Declaration regarding track record
To,
The Chairman,
Department of Electronic Systems
Engineering Indian Institute of
Science, Bangalore – 560012

Ref: Tender No: XXXXXXXX
Dated: XXXXX

Supply of AlGaIn/GaN HEMT d-mode Wafers

Dear Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company/firm is not currently debarred /blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted / debarred by Government / Organizations /Institutions	Reason	Since when and for how long
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(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully
(Signature of the Bidder)

Name
Designation, Seal

Date:



Indian Institute of Science Bangalore

Prof. Mayank Shrivastava
Professor
Department of Electronic Systems Engineering
Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

Annexure-4

Declaration of the acceptance of
Terms and Conditions
To,
The Chairman,
Department of Electronic
Systems Engineering Indian
Institute of Science,
Bangalore – 560012

Ref: Tender No: XXXXXX
Dated: XXXX

Supply of AlGaIn/GaN HEMT d-mode Wafers

Dear Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)
Name
Designation, Seal

Date:



Indian Institute of Science Bangalore

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Department of Electronic Systems Engineering
Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

Annexure-5

Details of items quoted:

a. Company Name	
b. Product Name	
c. Part / Catalogue number	
d. Product description / main features	
e. Detailed technical specifications	
f. Remarks	

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.



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560012, Bangalore, Karnataka, India

6. Commercial bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned under:

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Essential items noted in the technical specification				
1.a	... (details of essential items)				
1.b	...				
2.	Optional items noted in the technical specification				
2.a	... (details of Optional items)				
2.b	...				
3.	Accessories for operation and installation				
4.	All Consumables, spares and software to be supplied locally				
5.	Warranty (1 year)				
6.	AMC 2 years beyond warranty				

Any additional items

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total

Addressed to

The Chairman,
Department of Electronic
Systems Engineering Indian
Institute of Science,
Bangalore – 560012



Indian Institute of Science Bangalore

Prof. Mayank Shrivastava
Professor
Department of Electronic Systems Engineering
Indian Institute of Science Bangalore
560012, Bangalore, Karnataka, India

7. Checklist

(This should be enclosed with technical bid- Part A)

The following items must be checked before the Bid is submitted:

1. Sealed Envelope “A”: Technical Bid

1. Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:
 - a. Annexure 1: Bidders details
 - b. Annexure 2: Declaration regarding experience
 - c. Annexure 3: Declaration regarding clean track record
 - d. Annexure 4: Declaration for acceptance of terms and conditions
 - e. Annexure 5: Details of items quoted
2. Copy of this tender document duly signed by the authorized signatory on every page and sealed.

2. Sealed Envelope “B”: Commercial Bid

Section 6: Commercial Bid

Your quotation must be submitted in two envelopes: Technical Bid (Envelope A) and Commercial Bid (Envelope B) super scribing on both the envelopes with Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date.

*(To be submitted In the company letter head by supplier)

Declaration of Local Content by Local supplier

Subject: Public Procurement (Preference to Make In India)

References:

Preference to Make in India including counter offering will be as per the Public Procurement (Preference to Make in India), Order 2017 available in the following links <https://dipp.gov.in/public-procurements>

http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf

http://dipp.nic.in/sites/default/files/Revised-PPP-MII-Order-2017_28052018.pdf

https://dipp.gov.in/sites/default/files/PPP-MII%20Order%20dt%2029th%20May%2019_0.pdf

<https://dipp.gov.in/sites/default/files/PPP%20MII%20Order%20dated%204th%20June%202020.pdf>

We hereby declare with reference to above subject and references that

M/s -----(Tick whichever is applicable as below)

"Class-I local supplier" meeting the requirement of minimum local content equal to 50% (fifty percent) or more defined in the above government notification for the goods and services

(or)

"Class-II local Supplier" meeting the requirement of local content 20% to less than 50% (fifty percent) defined in the above government notification for the goods and services

(or)

Non Local supplier (If not belonging to Class-I & Class-II)

Please mention the details against the following:

Enquiry no:----- dated. -----

Type of Supplier (Class-I/Class-II)

Product:-----

Project:.....

Details of location at which local value addition will be made is as follows: _____

We also understand that the false declarations will be in breach of the code of Integrity under rule 175(1)(i)(h) of the General financial rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Authorized Signature M/s-----

(Signature and seal)

Place:.....

Date:.....