

Dr. A. MOHANBABU M.E, Ph.D
Assistant Professor (Senior Grade) ,
Department of Electronics and Communication,
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Dr. A. Mohanbabu received the Bachelor of Engineering (B.E.) in Electronics and Communication Engineering from Anna University, Chennai and Master degree (M. E.) in VLSI Design from Anna University, Chennai, India in 2011 and 2013 respectively. He has awarded the PhD in Mar 2018 with the thesis title “Advanced III-V Heterostructure Quantum Well Devices with Enhancement Mode (E-Mode) Operation for High-Power Switching, Analog/RF Applications”, Department of Information and Communication Engineering, Anna University, Chennai, India in the area of Compound Semiconductor device modeling and simulation. And also he granted Senior Research Fellowship (SRF) from CSIR, HRD [Award No: (09/468/0497/2016 EMR-I)] for pursuing his Full-time PhD research for two years. At present Dr. A. Mohanbabu is with Electronics and Communication Engineering department, SRM Institute of Science and Technology, Ramapuram, Chennai, India as an Assistant Professor. He has published nearly 27 Science Indexed (SCI) journal and 4 Scopus journals in International reputed journals in the same area. He is reviewer of various journals such as IEEE Transaction on Device Materials and Reliability, IEEE Access, IETE Technical Review, etc. His current interests are in Nano-electronic device modelling, simulation and characterization of High-power GaN devices.

Google scholar : <https://scholar.google.co.in/citations?user=NLyBMgEAAA&hl=en>

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=55884251500>

Research/Teaching Interests:

Nanoelectronics, 1D / 2D III – V Materials, Graphene, Carbon nanotubes, GaN Technology, Nanoscale device design and modelling, Device and circuit simulation- GSI, Sensors, VLSI Technology, Microwave Engineering, Solid State Devices, Electron Devices and Digital Electronics.

1. Academic Qualification (Undergraduate Onwards)

Degree	Year	Subject	University/Institution	% of marks
Ph.D (Full-Time)	2018	Nanoelectronic devices, Device modelling & Simulation	Anna University, Chennai	Highly Commended
M.E (Full-Time)	2013	VLSI Design	Anna University, Chennai	8.5 (CGPA)
B.E (Full-Time)	2011	Electronics and Communication Engineering	Anna University, Chennai	76

2. Ph.D thesis title, Guide's Name, Institute/Organization/University, Year of Award.

Ph.D thesis title:

Advanced III-V Heterostructure Quantum Well Devices with Enhancement Mode (E-Mode) Operation for High-Power Switching, Analog/RF Applications.

Institute/Organization/University: Anna University, Chennai

Year of Award: 2018

3. Work experience:

S.No.	Positions held	Name of the Institute	From	To
1	Assistant Professor	S.K.P Engineering College, Tiruvannamalai	1 st July 2013	1 st June 2015
2	Assistant Professor	Karpagam college of Engineering (KCE), Coimbatore	4 th June, 2018	30 th June, 2020
3	Assistant Professor (Senior Grade)	SRM Institute of Science and Technology, Ramapuram, Chennai.	4 th Jan 2021	Till date

4. Professional Recognition/ Award/ Prize/ Certificate, Fellowship received by the applicant

S.No	Name of Award	Awarding Agency	Year
1	CSIR- Senior Research Fellowship (SRF)	Council of Scientific & Industrial Research Council, Human Resource Development Group (HRD) - CSIR Award No: (09/468/0497/2016 EMR-I)	1st April 2017– 1st May 2018 Pay scale: 33,600/- per Month for 2 years

5. Publications (List of papers published in SCI Journals, in year wise descending order)

Key publications of the Investigator during the last 5 years

List of significant publications: (Only few)

1. C Sivamani, P Murugapandiyam, **A Mohanbabu**, Fletcher Augustine "High performance enhancement mode GaN HEMTs using β -Ga₂O₃ buffer for power switching and high frequency applications: A simulation Study", Microelectronics Journal, Accepted, 2023 (Impact factor: 2.2)
2. Varadhan Janakiraman, **Anandan Mohanbabu**, Shanmugam Maheswari, Androse Daniel Raj, Sanjoy Deb, Nallathambi VinodhKumar, "Noise characterisation of GaN current aperture vertical electron transistor metal-insulated semiconductor field effect transistor with Δ -shaped gate for low noise radio frequency amplifiers, International Journal of RF and Microwave Computer-Aided Engineering, Wiley, e23401, Sep 2022. **Impact factor: 1.984.**
3. **Mohanbabu Anandan**, Revathy Angamuthu, Boopathi Chettia Goundar Sengodan, Arathy Varghese, Bharath Sreenivasulu Vakkalakula, "L_G 55 nm T-gate InGaN/GaN channel based high electron mobility transistors for stable transconductance operation", International Journal of RF and Microwave Computer-Aided Engineering, Wiley, Vol. 32, Issue 10, e23308, Oct 2022. **Impact factor: 1.984.**
4. Daniel, J.A., Moovendan, M., **Mohanbabu, A.** "Advancement of a Hybrid Energy Storage Framework (HESS) For Electric and Plug-in Hybrid Electric Vehicles: A Modern Control Technique, Journal of Pharmaceutical Negative Results, 13, pp. 1563–1569, 2022.

5. **A.Mohanbabu**, Daniel Raj A; Sanjoy Deb; Saravana Kumar R, "Impact of Recessed Δ -shaped Gate Vertical CAVET AlGa_N/Ga_N MIS-HEMT for High-power, low-loss switching applications", *Journal of Electronic Materials*, Springer, 2021. **Impact factor: 1.774.**
6. **A.Mohanbabu**, M. Saravannan, J. Ajayan, S, Baskaran, "Design and Development of AlGa_N/Ga_N HEMT for biosensing applications for detection of cancers, Tumours, and kidney malfunctioning", *Electronic Devices, circuits and systems for Biomedical Applications – Challenges and Intelligent Approach – Elsevier 2021.*
7. P.Murugapandiyam, **A.Mohanbabu**, V.RajyaLakshmi, V.N.Ramakrishnan, Arathy Varghese, "Performance analysis of HfO₂/InAlN/AlN/GaN HEMT with AlN buffer layer for high power microwave applications", *Journal of Science: Advanced Materials and Devices*, Vol. 5, Issue 2, pp. 192-198, June 2020. **Impact factor: 3.783.**
8. P. Murugapandiyam, **A. Mohanbabu**, V. Rajya Lakshmi, Mohammed Wasim & K. Meenakshi Sundaram" Investigation of Quaternary Barrier InAlGa_N/Ga_N/AlGa_N Double-Heterojunction High-Electron-Mobility Transistors (HEMTs) for High-Speed and High-Power Applications, *Journal of Electronic Materials*, vol. 49, pp. 524–529 (2020). **Impact factor: 2.047.**
9. Baskaran Subramanian, **Mohanbabu Anandan**, Saminathan Veerappan, Murugapandiyam Panneerselvam, Mohammed Wasim "Switching Transient Analysis and Characterization of an E-Mode B-Doped Ga_N-Capped AlGa_N DH-HEMT with a Freewheeling Schottky Barrier Diode (SBD)", *Journal of Electronic Materials*, 49, pp. 4091–4099, 2020. **Impact factor: 1.774.**
10. **A.Mohanbabu**, Yusuf U.Tarauni, John Thiruvadigal, Bijo Joseph, "Optimization of enhancement mode P-type Mg-doped In_{0.2}Ga_{0.8}N cap gate DH-HEMT for low-loss high power efficient boost converter circuits", *Materials Science in Semiconductor Processing*, Vol. 103, Nov. 2019, 104624. **Impact factor: 3.085.**
11. **A. Mohanbabu**, N. Anbuselvan, N. Mohankumar "Analytical modeling of 2DEG with 2DHG Polarization Charge density drain current and Small-signal model of Quaternary AlInGa_N HEMTs for Microwave frequency Applications", *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, Vol. 32, Issue 5, Sep/Oct 2019, e2609. **Impact factor: 0.88.**
12. **A.Mohanbabu**, N.Mohankumar, N.Anbuselvan "Analytical noise characterization of quaternary AlInGa_N HEMTs", *J. Nanoelectron. Optoelectron.* Vol.14, pp. 247–254 (2019), **Impact Factor: 0.567.**
13. **A. MohanBabu**, A. Najma, B. Mohana "GSM Based Door Lock System", *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, Vol. 8, Issue 6S, pp. 229-231, 2019.
14. R.Sruthilakshmi **A.Mohanbabu**, S.Deepika, R.Janani vidhya, M.Santhan "Retinal Microaneurysms Detection using Local Convergence Index Features", *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, Vol. 8, Issue 8S, pp. 7-11, 2019.
15. **A. Mohanbabu**, N. Mohankumar, R. Saravanakumar, "Comparative assessment of InGaAs sub-channel and InAs composite channel Double gate (DG)-HEMT for Sub-millimeter wave applications", *AEU - International Journal of Electronics and Communications*, Vol. 83, pp. 462-469, January 2018. **Impact factor: 2.924.**
16. **A. Mohanbabu**, N. Mohankumar, R. Saravanakumar, "Noise Characterization of Enhancement-mode AlGa_N Graded barrier MIS-HEMT Devices", *Superlattices and Microstructures*, Vol. 112 , pp. 604-618, December 2017. **Impact factor: 2.123.**
17. **A. Mohanbabu**, N.Mohankumar, R.SaravanaKumar, "Simulation of InGaAs Sub-channel DG-HEMT for analog/RF application", *International Journal of Electronics*, Taylor and Francis journal, pp. 1-11, Sep. 2017., **Impact factor: 1.004.**
18. **A.Mohanbabu**, N.Mohankumar, R.SaravanaKumar, D.Godwinraj "In_{0.7}Ga_{0.3}As/InAs/In_{0.7}Ga_{0.3}As Composite Channel Double Gate (DG)-HEMT Devices for High-Frequency Applications", *Journal of Computational electronics*, Springer, Vol. 16, issue. 3, pp. 732-740, Sep. 2017. **Impact factor: 1.532.**
19. **A. Mohanbabu**, N. Mohankumar, D. Godwin Raj, Sarkar P, Saha SK. "Device characteristics of enhancement mode double heterostructure DH-HEMT with boron-doped Ga_N gate cap layer for full-bridge inverter circuit", *Int J Numer Model.*, Wiley publication, pp. 1-15; Vol. e2276, August 2017, **Impact factor: 0.88.**
20. **A.Mohanbabu**, N. Mohankumar, D. Godwin raj, Partha Sarkar, "Investigation of enhancement mode HfO₂ insulated N-polarity Ga_N/InN/GaN/In_{0.9}Al_{0.1}N heterostructure MISHEMT for high-frequency applications", *Physica E: Low-dimensional Systems and Nanostructures*, pp. 23-29, Vol. 92, Aug. 2017. **Impact factor: 3.570.**

21. **A.Mohanbabu**, N. Mohankumar, D.Godwin raj, Partha Sarkar, Samar K. Saha “Efficient III-Nitride MIS-HEMT devices with high- κ gate dielectric for high-power switching boost converter circuits”, Superlattices and Microstructures, Vol. 103, pp. 270-284, Mar. 2017. **Impact factor: 2.123.**
22. **A.Mohanbabu**, N.Mohankumar, S.Baskaran, “Analysis and Impact of Al mole concentration ‘x’ in Double Heterojunction AlGa_N with Source and Gate Field plated HEMT for High breakdown and High Frequency applications” Global Journal of Pure and Applied Mathematics (GJPAM), Vol. 13, no. 10, pp. 7339-7352, (2017). **Impact factor: 0.61.**
23. **A.Mohanbabu**, N.Mohankumar, S.Baskaran, "A Charge Based Compact Physical Model with Unified 2DEG for AlGa_N/AlN/GaN MISHEMTs including SCEs", International Journal of Control Theory and Applications, Vol.10, no. 36, pp. 11-29, (2017). **Impact factor: 0.61.**
24. S. Baskaran, **A.Mohanbabu** and Dr. N. Mohankumar, "Analysis and Impact of Al mole concentration ‘x’ in Double Heterojunction AlGa_N with Source and Gate Field plated HEMT for High breakdown and High Frequency applications", Global Journal of Pure and Applied Mathematics. ISSN 0973-1768 Volume 13, Number 10 (2017), pp. 7339-7352.
25. **A.Mohanbabu**, N. Mohankumar, S.Baskaran, P.Anandan, N.Anbuselvan and P.Bharath ivikkiraman “Modeling of Sheet Carrier Density, DC and Transconductance of Novel In_xAl_{1-x}N/GaN-Based HEMT Structures” Advanced Materials Research, Vol. 1105, pp. 99-104, May 2015. **Impact Factor: 0.23.**
26. **A.Mohanbabu**, N.Mohankumar, N.Anbuselvan, Godwin Raj, Chandan Kumar Sarkar “Modeling of Sheet carrier density and Microwave frequency characteristics in Spacer based AlGa_N/AlN/GaN HEMT Devices”, Solid State Electronics, Vol. 91 pages 44–52, (2014). **Impact Factor 1.437.**
27. **A.Mohanbabu**, N.Mohankumar, S.Baskaran, N.Anbuselvan, Godwin Raj, Chandan Kumar Sarkar “Modeling of Sheet carrier density and DC characteristics in Spacer based AlGa_N/AlN/GaN HEMT Devices”, Superlattices and Microstructures, Vol. 64, pp. 470–482, (2013). **Impact Factor: 2.123.**

International Conference Publications:

- **Mohanbabu** and N. Mohankumar, "Recessed Mg-doped P-type In_{0.2}Ga_{0.8}N cap Gate AlGa_N/Ga_N/AlGa_N DH-HEMT for high breakdown and power electronics applications," 2016 International Conference on Inventive Computation Technologies (ICICT), Coimbatore, India, 2016, pp. 1-4, doi: 10.1109/INVENTIVE.2016.7823298.
- S. Tamilselvi, S. Tamilarasi, **A. Mohanbabu** and N. Mohankumar, "Analysis of noise performance in InAs DG-MOSHEMT," 2017 Devices for Integrated Circuit (DevIC), Kalyani, India, 2017, pp. 695-698, doi: 10.1109/DEVIC.2017.8074039.
- M. S. Begum, J. Vijayashree, **A. Mohanbabu** and N. Mohankumar, "Investigation of performance of InAsSb based high electron mobility transistors (HEMTs)," 2017 Devices for Integrated Circuit (DevIC), Kalyani, India, 2017, pp. 699-701, doi: 10.1109/DEVIC.2017.8074040.
- N. A. Gladith, B. Sinduja, **A. Mohanbabu** and N. Mohankumar, "DC, RF and noise figure analysis of p+ In_{0.2}Ga_{0.8}N cap gate AlGa_N DH-HEMT," 2017 Devices for Integrated Circuit (DevIC), Kalyani, India, 2017, pp. 708-710, doi: 10.1109/DEVIC.2017.8074042.
- N. Vinodh Kumar, **A. Mohanbabu**, K. Rasaily and S. Veera Manikanta, "Performance Analysis of FinFET based Ternary Inverter," 2022 IEEE International Conference on Nanoelectronics, Nanophotonics, Nanomaterials, Nanobioscience & Nanotechnology (5NANO), Kottayam, India, 2022, pp. 1-6, doi: 10.1109/5NANO53044.2022.9828879.

6. Detail of patents.

- Wireless Sensor based artificial intelligence systems and device for fetal health monitoring during pregnancy – 202141045592 (Patent no) – Published
- A Diabetics management system – 357829-001 (Design Patent) – Granted

7. Books/Reports/Chapters/General articles etc

S.No	Title	Author's Name	Publisher	Year of Publication
1	Design and Development of AlGa _N /Ga _N HEMT for	A.Mohanbabu, M. Saravannan, J.	Electronic Devices, circuits and systems for Biomedical	2021, pp. 95-114

	biosensing applications for detection of cancers. Tumors, and kidney malfunctioning	Ajayan, S, Baskaran	Applications – Challenges and Intelligent Approach – Elsevier (2021)	
2	E-Mode-Operated Advanced III-V Heterostructure Quantum Well Devices for Analog/RF and High-Power Switching Applications	A. Mohanbabu, N. Vinodhkumar, S. Maheswari, S. Baskaran,	Nano Devices for IC Design – Taylor and Fransis	2023

8. Any other Information:

- Guiding one Part-time external research Scholar - PRISCILLA (PC2313004013004) –SRM University
- Achieved Anna University rank holder in P.G studies (M.E VLSI Design)
- Received Anna University PhD Research Supervisorship (reference id: 3440009)
- SRM Research Supervisorship (reference id: SRMIST/R/tap.6505-Estt/2021-3926).