

## Faculty Profile

**Mr. Raj Kumar. J. S.**

Assistant Professor,

Department of Computer Science and Engineering

email id: rajkumar@karunya.edu



### Academic Background

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Degree	University	Year
Ph.D. Nano Electronics	Karunya Institute of Technology and Sciences	2023
M.E VLSI Design	Karunya Institute of Technology and Sciences	2019
B.E ECE	Karunya Institute of Technology and Sciences	2016

### Research Interests

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- Device Modelling
- GaN Technology
- Nanoscale Device Design
- Digital Electronics

### Most recent Publications

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#### International Journals Publications

1. J. S. Raj Kumar, D. Nirmal, J. Ajayan "Investigation on LG = 50 nm Tapered T-Gated AlGa<sub>N</sub>/Ga<sub>N</sub> HEMT on Silicon Wafer with a  $f_T/f_{max}$  of 264/312 GHz for beyond 5G (B5G) Applications" Silicon 2022, (Impact Factor:2.94)
2. J. S. Raj Kumar, D. Nirmal, Manish Kumar Hooda, Surinder Singh, J. Ajayan & L. Arivazhagan, "Intensive Study of Field-Plated AlGa<sub>N</sub>/Ga<sub>N</sub> HEMT on Silicon Substrate for High Power RF Applications" Silicon 2021, (Impact Factor:2.94)

3. L. Arivazhagan, D. Nirmal, Subhash Chander, J. Ajayan, J. S. Rajkumar, D. Godfrey & S. Bhagya Lakshmi "Variable thermal resistance model of GaN-on-SiC with substrate scalability", *Journal of Computational Electronics*, Volume 19, Issue 4, December 2020, Pages 1546-1554, DOI: 10.1007/s10825-020-01561-y, (Impact Factor:1.730)
4. L. Arivazhagan , , D. Nirmal, D.Godfrey, J. Ajayan , P.PrajoonA.S. Augustine Fletcher, J.S.Raj Kumar and A.Amir Anton Jone, "Improved RF and DC performance in AlGaIn/GaNHEMT by P-type doping in GaN buffer for millimetre-wave applications", *International Journal of Electronics and Communications (AEU)*, Vol 108, (2019) Pg 189-194. (Impact Factor:3.183)

### **International Conference Publications**

1. P Pavan Kumar Reddy, S Bhagya Lakshmi, L Arivazhgan, J S Raj Kumar and D Nirmal, AlGaIn/GaN HEMT for highly sensitive detection of Bio- molecules using transconductance method IOP Conference Series: Materials Science and Engineering, doi:10.1088/1757-899X/872/1/012048
2. L. Arivazhagan, Anwar Jarndal, SubhashChander, Godfrey D, Raj Kumar J S, S Bhagyalakshmi, Pavan Kumar Reddy and D.Nirmal, "Self-Heating Analysis of GaN-HEMT for Various Ambient Temperature and Substrate Thickness" *IEEE Conference Proceedings on 2020 5th International Conference on Devices, Circuits and Systems, ICDCS20, Coimbatore, India, 5th-6th March 2020.*
3. Raj Kumar, J.S., Nirmal, D., Arivazhagan, L., Pandit, P.P, "DC and RF analysis of AlGaIn/GaN MOSHEMT for High-Power Applications" – 2nd *IEEE International Conference on Signal Processing and Communications (ICSPC'19) 2019*, pp. 380–383.
4. Arivazhagan.L, D.Nirmal, Ajayan.J, Rajkumar.J.S, Godfry.D, Bhagya.S, "Modeling of self-heating for AlGaIn/GaNHEMT with thermal conductivity degradation effect" *AIP Conference Proceedings 2nd International Conference on Material Science, Smart Structures and Applications, ICMSS 2019, Erode, India, Volume 2201, 17 December 2019.*
5. Arivazhagan.L, D.Nirmal, Ajayan.J, Rajkumar.J.S, Godfry.D, Bhagya.S, "Enhancement of drain current in AlGaIn/GaNHEMT using AlN passivation" *AIP Conference Proceedings 2nd International Conference on Material Science, Smart Structures and Applications, ICMSS 2019, Erode, India, Volume 2201, 17 December 2019.*
6. Pandit.P.P, Arivazhagan.L, D.Nirmal, Prajoon.P, Ajayan.J, Rajkumar.J.S, "DC Performance analysis of AlGaIn/GaNHEMT for future High power applications" *IEEE International Conference on Devices, Circuits and Systems, ICDCS 2018; Karunya University, Coimbatore, pp- 313-318.*

## Significant achievements

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- Senior Research Fellow (SRF) in ISRO Funded Respond Project, Semi-Conductor Laboratory - SCL, Research institute of the Department of Space, India. From August 2019- July 2022.
- Worked as Intern in Defence Research and Development Organisation (DRDO), Ministry of Defence, Delhi, India.
- Completed the Long-term program on Modeling and Simulation of Nano-Transistors conducted by the Department of Electrical Engineering from Indian institute of technology, Kanpur, India.