

# REPORT ON ONE-DAY INDUSTRIAL VISIT



AT  
**SOCIETY FOR APPLIED MICROWAVE ELECTRONICS ENGINEERING  
& RESEARCH (SAMEER)**

KOLKATA

29/11/2024

ACADEMIC SESSION 2024-25

DEPT. OF ELECTRONICS & COMMUNICATION ENGG.

HALDIA INSTITUTE OF TECHNOLOGY



GPS Map Camera



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Kolkata, West Bengal, India  
L2, Near Rdb Cinemas, Gp Block, Sector V, Bidhannagar,  
Kolkata, West Bengal 700091, India  
Lat 22.568464° Long 88.432273°  
29/11/24 02:32 PM GMT +05:30



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Kolkata, West Bengal, India  
Tata Consulting Engineers Building, Jc Block, Sector 3,  
Bidhannagar, Kolkata, West Bengal 700106, India  
Lat 22.569867° Long 88.414074°  
29/11/24 03:31 PM GMT +05:30

## ABSTRACT

The visit included a guided tour of SAMEER's specialized laboratories and research setups, facilitated by scientific officers and co-ordinated by Dr. Tilak Mukherjee (Associate Professor, ECE Dept.). Students explored various facilities including the PCB Assembly Room, EMI/EMC Lab, Anechoic Chamber, W-Band Measurement Lab, and On-Wafer Device Characterization Lab. The demonstrations helped students understand the applications of microwave and RF components, circuit diagnostics, testing procedures, and design principles applied in real-world scenarios. The experience fostered enthusiasm for research and innovation among students.

## INTRODUCTION

The Department of Electronics and Communication organized an industrial visit to the Society for Applied Microwave Electronics Engineering & Research (SAMEER), Kolkata. SAMEER is an autonomous R&D institution under the Ministry of Electronics and Information Technology, Government of India, engaged in advanced research in the field of microwave, RF, and millimeter-wave electronics. This visit aimed to provide students with exposure to real-time high-frequency measurement tools, advanced laboratory facilities, and SAMEER's ongoing contributions in defense, space, and healthcare technology sectors.

## OBJECTIVES OF THE VISIT

- To understand the design / inspection of RF and microwave circuit boards; and gain insights into EMI/EMC testing, compliance standards.
- To explore high-frequency measurement techniques in millimeter-wave bands.
- To observe on-wafer RF component testing and reliability analysis methods.
- To learn about SAMEER's role in defense, healthcare, and space applications.
- To bridge the gap between theoretical knowledge and industrial applications by observing real time operations and workflows and further inspire students to pursue careers in Applied Electronics and RF research.

## HOST INSTITUTION

SAMEER (Society for Applied Microwave Electronics Engineering & Research) is a premier institution under the Ministry of Electronics and Information Technology, Govt. of India. It specializes in R&D in RF/microwave systems, EMI/EMC compliance, millimeter-wave devices, and medical electronics. The Kolkata center is equipped with state-of-the-art labs and contributes to projects for ISRO, DRDO, and other national programs. SAMEER also focuses on training and industry collaboration in high-frequency electronic systems.

## BRIEF VISIT SCHEDULE

- Arrival and welcome session by SAMEER faculty.
- Introduction to SAMEER's research and mission.

- Demonstration in PCB Assembly and Inspection Room.
- Walkthrough of EMI/EMC and Anechoic testing labs.
- Live demos in the W-Band and Device Characterization Labs.
- Q&A and discussion on career prospects in electronics R&D.
- Conclusion and feedback session.

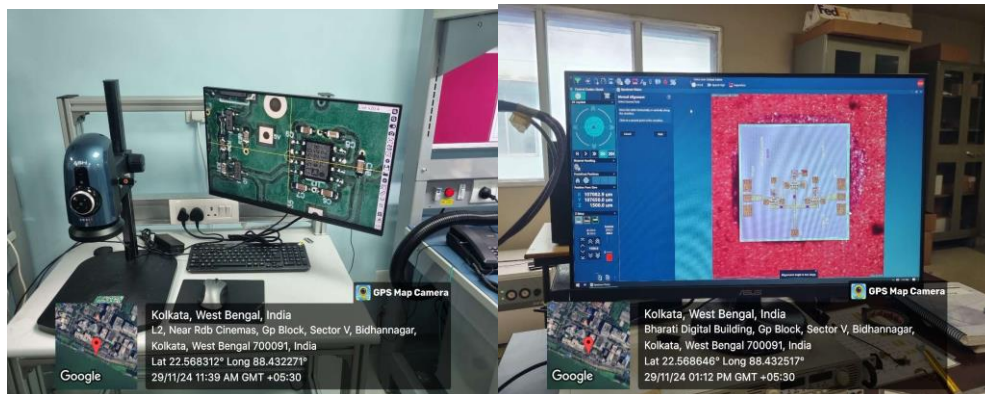
## OBSERVATIONS AND LEARNING OUTCOMES: TAKEAWAYS

- Understanding PCB testing, fault detection, and circuit analysis.
- Knowledge exposure to international EMI/EMC compliance and testing protocols.
- Explored anechoic and semi-anechoic chamber operations for RF isolation testing.
- Understood W-band applications in modern defense and imaging systems.
- Observed wafer-level probing and environmental testing setups.
- Learned about SAMEER's multidisciplinary role across defense and healthcare sectors.

## SUMMARY OF THE VISIT

The visit began with an orientation and introductory session led by SAMEER personnel. Under the guidance of Dr. Tilak Mukherjee, students toured the following key facilities:

1. PCB Assembly Room: Equipped with ESD-safe workstations, inspection systems for PCB comparison, assembly microscopes, and a PNA Network Analyzer (10 MHz – 26.5 GHz).



2. EMI/EMC Lab: Students observed emissions testing through cables, voltage dips, Electrostatic Discharge (ESD) testing (2kV – 25kV), and Electrical Fast Transient (EFT) testing.
3. Anechoic Chamber: A semi-anechoic room used for RE (Radiated Emission) and RS (Radiated Susceptibility) testing, simulating signal isolation conditions.
4. W-Band Measurement Lab: Showcased tools operating in the 75–110 GHz range, such as spectrum analyzers, W-R10 components, and signal source analyzers. Applications in defense and medical fields were discussed.
5. On-Wafer Device Characterization Lab: Provided insights into direct wafer-level testing using advanced probe stations and thermal cycling chambers.



### List of the students from ECE Dept.

- 1.Aarohini (3<sup>rd</sup> year)
- 2.Ashutosh Kumar Pathak(3<sup>rd</sup> year)
- 3.Avinash Kumar (3<sup>rd</sup> year)
- 4.Barnik Pal (3<sup>rd</sup> year)
- 5.Pradipta Choudhury (3<sup>rd</sup> year)
- 6.Rohit Kumar Sharma (3<sup>rd</sup> year)

### CONCLUSION

The industrial visit to SAMEER, Kolkata, proved to be an invaluable experience for the students. It allowed them to witness the real-world applications of microwave and RF technologies and their impact across sectors. The exposure to advanced tools, methodologies, and practical challenges in the field enriched their academic understanding and encouraged them to delve deeper into research and development in electronics. Such visits play a crucial role in shaping the future career paths of budding engineers by connecting theory with practical innovation.

Report submitted by:

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