ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

MUR DM 118 - Study of interfaces for System-in-Package (SiP) and design and development of innovative packaging processes

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Context of the research activity	The increasing demand for smaller and more powerful electronic devices has led to the development of SiP technology, which integrates multiple functions and components into a single package. The success of SiP technology relies heavily on the design and development of efficient interfaces and innovative packaging processes. This study aims to explore various interface designs for SiP, with a focus on improving electrical, mechanical, and thermal performance. Progetto finanziato nell'ambito del PNRR – DM 118/2023 - CUP E14D23001730006

Objectives	The research work aims to investigate and advance the understanding of SiP interfaces, focusing on optimizing electrical, mechanical, and thermal performance. During the activity, various interface designs, considering factors such as signal integrity, power distribution, and interconnect density will be studied and simulated. A particular attention will be focused on the fact that innovative packaging processes are, as a matter of fact, an enabling technology to address challenges related to size constraints, power dissipation, and manufacturability. The study will employ a multidisciplinary approach, combining theoretical analysis, computer simulations, and experimental validations to enhance the performance and reliability of SiP interfaces and packaging. The outcomes of this research will contribute to the advancement of SiP technology, enabling the creation of more compact, efficient, and robust electronic systems for diverse applications, including consumer electronics, telecommunications, and automotive industries.

Skills and competencies for the development of the activity	Some experience and willingness for research activity • Background in semiconductor materials • Background in electronics • Background in processes and technologies used for manufacturing semiconductor devices • Background in simulation tools (FEM Methods) • Background in software tools (Python, C++, VBS, VBA, Visual Basic) • Teamwork mindset and ability to work in multi-disciplinary environment • Good logical and analysis capability, including good self-organizational mindset