PhD in

Information Technology

Research Area n. 2 - Title Electronics

Research Title: Electrical Characterization and Modeling of Instabilities in 3D Flash NAND

Scholarships and Financial support	
Monthly net income of PhD scholarship (max 36 months)	€. 1.200 (In case of a change of the welfare rates during the three-year period, the amount could be slightly modified)
Number of scholarships	1
Beginning of PhD	1/5/2017
Deadline for application	13/3/2017
Context of the research activity	
Motivations and objectives of the research in this field	3D array architectures are currently emerging as the most viable solution to keep the historical growth of the bit storage density of NAND Flash memories over the next decade. However, the transition from planar to 3D NAND arrays is requiring huge research efforts, aiming at ensuring optimal cell operation and reliability. Within this context, the Ph.D. activities will be focused on the experimental characterization and theoretical modeling of threshold-voltage instabilities in 3D NAND arrays. Results are expected not only to clarify the physical origin and the possible impact of instabilities on array operation, but also to suggest solutions to keep them

	under control and optimize the design of 3D NAND technologies.
Methods and techniques that will be developed and used to carry out the research	The research will involve the experimental characterization of memory arrays via dedicated measurement setups as well as the development of suitable models, including compact models and TCAD models, for the physical interpretation of the explored reliability issues.
Educational objectives	The candidate will gain specific skills in the field of semiconductor memory technologies, with a strong expertise on the characterization and physical modeling of the operation and the reliability of 3D NAND Flash arrays.
Job opportunities	Students undertaking the Ph.D. program in the proposed field will find possible job opportunities in the top semiconductor companies and research centers in the world.
Composition of the research group	Number of Full Professors: 1 Number of Associate Professors: 1 Number of Assistant Professors: 0 Number of Post-Docs: 0 Number of Ph.D. students: 2 Number of contracted researchers: 0
Names of the research directors	Christian Monzio Compagnoni Alessandro S. Spinelli
E-mail address, phone number and web-page	Email: christian.monzio@polimi.it Phone: 02 2399 4038 Email: alessandro.spinelli@polimi.it Phone: 02 2399 4001
List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research	1. Micron Semiconductor Italia, Vimercate, Italy 2. Micron Technology Inc., Boise, ID, USA
Additional support	
Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student per year	2nd year: 1.370 euro per student 3rd year: 1.370 euro per student
Teaching assistanship:	Teaching activities of the Ph.D. student, which are encouraged within the limits allowed by university's regulations, will be financially supported.

availability of funding in recognition of supporting teaching activities by the PhD student	
Computer availability:	1st year: *individual use* 2nd year: *individual use* 3rd year: *individual use* A workstation cluster is available for shared use.
Desk availability:	1st year: *individual use* 2nd year: *individual use* 3rd year: *individual use*