

國立中山大學

專 題 演 講



講 題 : Electrostatic Discharge (ESD) Challenges in Silicon Nanowire Technology

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摘要: Electrostatic discharge (ESD) is a process in which a finite amount of charge is transferred from one object (i.e., human body) to the other (i.e., microchip). This process can result in a very high current passing through the microchip within a very short period of time, and more than 35% of chip damages can be attributed to such an event. As such, designing robust on-chip ESD structures to protect microchips against the ESD stress is a high priority in the semiconductor industry. The continuing scaling of CMOS technology makes the ESD-induced failures even more prominent, and one can predict with certainty that the availability of effective and robust ESD protection solutions will be a critical component to the success of the deep sub-micron technology advancement.

An overview on the ESD sources, models, protection schemes, and testing will first be given in this talk. This is followed by the investigation of ESD robustness of the advanced Si nanowire devices. Finally, the ESD challenges in Si nanowire technology will be addressed and discussed.

主辦單位 : 電機工程學系
協辦單位 : 工程技術研究推展中心



歡迎踴躍參加



Biography of Juin J. Liou

Juin J. Liou received the B.S. (honors), M.S., and Ph.D. degrees in electrical engineering from the University of Florida, Gainesville, in 1982, 1983, and 1987, respectively. In 1987, he joined the Department of Electrical and Computer Engineering at the University of Central Florida (UCF), Orlando, Florida where he is now the Pegasus Distinguished Professor and UCF-Analog Devices Fellow. His current research interests are Micro/nanoelectronics computer-aided design, RF device modeling and simulation, and electrostatic discharge (ESD) protection design and simulation.

Dr. Liou holds 5 U.S. patents (2 more filed and pending), and has published 8 books, more than 220 journal papers (including 14 invited articles), and more than 180 papers (including 70 keynote or invited papers) in international and national conference proceedings. He has been awarded more than \$9.0 million of research contracts and grants from federal agencies (i.e., NSF, DARPA, Navy, Air Force, NASA, NIST), state government, and industry (i.e., Semiconductor Research Corp., Intel Corp., Intersil Corp., Lucent Technologies, Alcatel Space, Conexant Systems, Texas Instruments, Fairchild Semiconductor, National Semiconductor, Analog Devices, RF Micro Device, Lockheed Martin), and has held consulting positions with research laboratories and companies in the United States, China, Japan, Taiwan, and Singapore. In addition, Dr. Liou serves as a technical reviewer for various journals and publishers, general chair or technical program chair for a large number of international conferences, and regional editor (in USA, Canada and South America) for the *Microelectronics Reliability* journal.

Dr. Liou received ten different awards on excellence in teaching and research from the University of Central Florida (UCF) and six different awards from the IEEE Electron Device Society. Among them, he was awarded the UCF Pegasus Distinguished Professor (2009) - the highest honor bestowed to a faculty member at UCF, UCF Distinguished Researcher Award (four times: 1992, 1998, 2002, 2009), UCF Research Incentive Award (two times: 2000, 2005), UCF Trustee Chair Professor (2002), and IEEE Joseph M. Biedenbach Outstanding Engineering Educator Award in 2004 for his exemplary teaching, research, and international collaboration. His other honors are Fellow of Institute of Engineering and Technology, Fellow of Singapore Institute of Manufacturing Technology, Fellow of UCF-Analog Devices, Distinguished Lecturer of IEEE Electron Devices Society (EDS), and Distinguished Lecturer of National Science Council. He holds several honorary professorships, including Chang Jiang Scholar Endowed Professor of Ministry of Education, China - the highest honorary professorship in China, NSVL Distinguished Professor of National Semiconductor Corp., USA, Chang Gung Endowed Professor of Chang Gung University, Taiwan, Chunhui Eminent Scholar of Peking University, China, Cao Guang-Biao Endowed Professor of Zhejiang University, China, Consultant Professor of Huazhong University of Science and Technology, China, and Courtesy Professor of Shanghai Jiao Tong University, China. Dr. Liou was a recipient of U.S. Air Force Fellowship Award and National University Singapore Fellowship Award.

Dr. Liou served as the IEEE EDS Vice-President for Regions/Chapters, IEEE EDS Treasurer, IEEE EDS Finance Committee Chair, IEEE EDS Administrative Committee Elected Member, and IEEE EDS Educational Activities Committee Member.