



25th International Conference on Electronic Packaging Technology

August 07 to 09, 2024, Tianjin, China

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Speech subject: Novel MEMS Passive Elements: Wafer-level Fabrication and System Integration

Speech leader: Sixing Xu, Associate Professor, Hunan University

Speech Description/Objective:

The rapid advancement of IoTs and wearable technologies has sparked a growing demand for more compact and integrated electronics. The primary challenge impeding the adoption of fully integrated power module, namely PwrSoC, lies in the limited performance densities of current on-chip passive elements. This speech will introduce our recent progress in novel MEMS passive elements, including the basic concept, main challenges, wafer-level fabrication and system integration.

Speech Outline:

- (1) The demand for passive components in integrated power systems
- (2) The basic principles and challenges of MEMS electrochemical capacitors
- (3) Wafer-level processing and packaging of MEMS electrochemical capacitors
- (4) Monolithic integration technology of MEMS electrochemical capacitors and MEMS inductors
- (5) Monolithic heterogeneous integration technology of electrochemical and semiconductor devices

Who Should Attend:

Researchers, technicians and graduate students in related fields who are interested in the field of integrated power supply and MEMS.

Introduction of Speaker:

Dr. Sixing Xu obtained his bachelor's and doctor's degrees from Tsinghua University's Department of Microelectronics & Nanoelectronics and School of Integrated Circuits in 2015 and 2021, respectively (Advisor: Professor Xiaohong Wang). Between 2018 and 2020, he undertook joint doctoral training at the Georgia Institute of Technology (Advisor: Professor Zhonglin Wang). Currently, he serves as an associate professor and doctoral supervisor at Hunan University's School of Semiconductors (School of Integrated Circuits) and been awarded Hunan High-Level Talent Program for Young Talents. Xu's research focuses on PowerMEMS and power ICs for integrated power systems. He has published 44 SCI/EI papers, receiving over 900 citations, with a highest citation count of 176 for a single paper. Twenty of these publications are as first author/corresponding author and include prestigious journals and conferences such as IEDM, National Science Review, IEEE Transactions on Circuits & Systems I, IEEE Transactions on Power Electronics, and IEEE Electronic Device Letters. His doctoral thesis was recognized as an Excellent Doctoral Thesis in Beijing in 2022. Xu's research achievements have led to six granted patents, and he has led projects funded by the NSFC and the Hunan Provincial Excellent Youth Program, while also playing a pivotal role in two key research and development projects of the Ministry of Science and Technology.