

Distinguished Lecture Devices-Circuits Co-Design for RF Communication & Embedded AI Memory

Date:

16 July 2021

Time:

19:00 to 20:00

Location:

Zoom platform

Space is limited

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Synopsis

The FinFET will soon reach the quantum-mechanical limit around 2022. Although the 2D material has certain potential to further down-scaling, it is still limited by the size of single molecule. In addition, breakthrough innovation is highly required to address the material-process related defects of 2D n- and p-materials over billions of transistors on 12-inch wafer.

Alternatively, RF communication and AI are the fast-growing technologies for 21st century. In this talk, a relatively new field of devices-circuits co-design will be presented. This is because neither device nor circuit alone can resolve the tough challenges for RF communication and embedded AI memory. Using this co-design methodology, excellent Si CMOS-based RF low noise (0.35dB @ 10 GHz), record-high RF power density (0.54 W/mm @ 2.4 GHz & 3V bias) and antenna switch RF power performance (29.2 dBm @ 28 GHz) have been achieved that were already implemented in various IC foundries & design houses. The devices-circuits co-design is also the crucial technology for Resistive Random-Access Memory (RRAM) devices target for large embedded-memory array. Such RRAM device has important merits beyond the capacitive-based Flash Memory. A 256×256 array can be effectively determined by this method even without the selector device.

Speaker



Professor Albert Chin
Institute of Electronics Engineering
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Albert Chin received the Ph.D. degree in electrical engineering from the University of Michigan. He was with AT&T Bell Labs, General Electric Electronic-Lab, Texas Instruments SPDC, and visiting professor at National University of Singapore. He is a Chair Professor of National Chiao Tung University.

He has co-authored >500 papers, three "Top 100 Scientific Reports Physics papers" in 2017~2019, one paper of "Top Articles in Device Physics of Applied Physics Letters", and 7 Highly Cited Papers. His paper citation h-index is 56, the top tiers researcher among Electrical Engineering fields of Taiwan.

Dr. Chin has served as Subcommittee Chair and Asian Arrangements Chair of International Electron Devices Meeting (IEDM) Executive Committee, Editor of *IEEE Electron Device Letters*, IEEE ED Society SRC Chair, and two Technical Committee Chairs on "Electronic Materials" and "Compound Semiconductor Devices & Circuits". He is an *IEEE Fellow*, *The Optical Society Fellow*, *Intl Assn Advanced Materials Fellow* and *Asia-Pacific Academy of Materials Academician*.

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