



IEEE MTT/AP Orlando Chapter Meeting

Robust CMOS Millimeter-Wave Integrated Circuits

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ABSTRACT:

Nano-scale CMOS technologies have enabled the cost effective implementation of many millimeter wave (mm-wave) frequency applications such as wireless HDMI, automotive radar and passive imaging systems. However, due to the limitations of the existing passive/active device modeling, together with the parasitic and coupling effects at very high frequencies, multiple silicon iterations are often needed to predict the performance of wireless transceiver circuits. Furthermore, the ultra-high frequency operation often invalidates many programmable methods, leading to transceiver front-end circuits hard to adjust for various performance requirements and compensate the ever increasing process variations. We investigate circuit techniques and design methodologies to enhance the robustness of mm-wave ICs. In this talk, the design of a 77GHz CMOS receiver suitable for automotive radar will firstly be introduced. Then the configurable Coplanar Waveguide (CPW) based sub-nH inductor structures, together with a unique ESD protection method for mm-wave front-end will be discussed toward robust implementation of mm-wave ICs.

BIOGRAPHY:



Dr. Yang Xu is an assistant professor in the department of Electrical and Computer Engineering in Illinois Institute of Technology. He received the B.S. and M.S. degrees in electrical engineering from Fudan University, Shanghai, China, in 1997 and 2000, respectively, and the Ph.D. degree in electrical and computer engineering from Carnegie Mellon University, Pittsburgh, PA, in 2004. He was a visiting Assistant Professor in the department of Electrical Engineering at Stanford University in 2010. Prior to joining the faculty at IIT, he was a senior researcher with Qualcomm Inc. where he worked on GPS/mobile TV and 3G cellular transceiver design. He was a recipient of the Inventor Recognition Award from the Microelectronics Advanced Research Consortium (MARCO) in 2004 and 2005. He is also a three time Qualcomm Inventor's Award recipient. He is a Senior Member of IEEE and a Member of Association for Computer Machinery (ACM).

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