



TEXAS A&M UNIVERSITY

Department of Electrical and Computer Engineering

College Station, Texas 77843-3128

TEL (409) 845-7498 FAX (409) 845-7161

sanchez@ece.tamu.edu

http://amsc.tamu.edu

S E M I N A R

Room 227A ZEC

Thursday, September 6, 2007 3:55 p.m. - 5:10 p.m.

High performance analog and RF circuits: LNAs and Multistage Amplifiers

by

Xiaohua Fan

Dept. of Electrical and Computer Engineering

College Station, TX 77843-3128

Abstract: High performance analog and RF circuits are critical for the wireless system operation. Two Low Noise Amplifiers (LNAs) are proposed, with one designed for narrowband application and the other for UWB application. A noise reduction technique is proposed for the differential cascode Common Source LNA (CS-LNA), which reduces the LNA Noise Figure (NF), increases the LNA gain, and improves the LNA linearity. At the same time, a novel Common Gate LNA (CG-LNA) is proposed for UWB application, which has better linearity, lower power consumption, and reasonable noise performance. Two novel multi-stage amplifier typologies are proposed to improve the bandwidth and reduce the silicon area for the application where a large capacitive load exists. They were designed using AMI 0.35 μ m CMOS technology. The simulation and measurement results show they have the best Figure-of-Merits (FOMs) in terms of small signal and large signal performances, with 4.6MHz and 9MHz bandwidth while consuming 0.38mW and 0.4mW power from a 2V power supply.

Xiaohua Fan received the B.S. degree in electrical engineering from Tsinghua University, in 1998 and the M.S. degree from the Chinese Academy of Sciences, Beijing, in 2001. He is currently working towards his Ph.D. degree at the Analog & Mixed-Signal Center, Texas A&M University. He worked at Analog Devices as a design engineer intern in the summer of 2005. He worked at Linear Technology as a design engineer intern in the summer of 2006. His research includes low-power multistage amplifier design and high performance RF Front-end design.

