Ronald L. Carter

Electrical Engineering Department, The University of Texas at Arlington, Arlington, TX 76019
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EDUCATION

1971 PhD (Physics) Michigan State University
Dissertation: Electrical Resistivity of Aluminum Alloys at Low Temperature
1964 MS (Physics) Iowa State University
Thesis: Thermal Diffusivity of Armco Iron
1962 BS (Physics) Iowa State University

PROFESSIONAL EXPERIENCE

1979 ... Professor in Electrical Engineering
The University of Texas at Arlington,
Arlington, TX 76019

Research Interests. Analog high frequency integrated circuit design. Silicon and III-IV device physics, modeling, characterization and simulation. High electron mobility transistor (HEMT), resonant tunneling diode (RTD), Heterojunction and bipolar junction transistors (HBT and BJT), step-recovery diode (SRD), thin oxide and EEPROM MOS transistors. **Past Graduate Advisor** and **Chairman of the Committee on Graduate Studies**. **Research Director** (1997 to present), NSF Center for Electronic Devices and Materials (CEMDAS). **Director** (1987 to 1990), NSF Center for Advanced Electron Devices and Systems (CAEDS). **Teaching** in Device Theory, E&M, Electronics, and IC Technology. Principal in over 6MUSD in research. Directed 20 graduate Theses and Dissertations. [Professor - '86, Tenure, '81]

1990 to 1991 NSF Industry/University Research Fellow.
Hewlett-Packard Network Measurements Division
Santa Rosa, CA 95408-1799

Sabbatical leave funded by HP and the NSF Industry/University Cooperative Research Directorate from 7/90 through through 5/91. Developed model equations for HBT, modification of dc and microwave model parameters of the Gummel-Poon model and verified for HBT devices made by HP, TI and TRW.

1977 to 1979 New Product and Process Development Engineer
Semiconductor Group, Texas Instruments, Dallas.

Development of processes, process flow and device characterization for new metal oxide semiconductor and charged coupled device large scale integrated circuits.

CONSULTING

1999 National Science Foundation Technical Panels - Reviewed Phase I STTR and Phase II SBIR proposals for award recommendations.

PROFESSIONAL SOCIETY ACTIVITIES

IEEE Member since October 1, 1980. Senior Member since March 1, 1990. Activities in IEEE Microwave Theory and Techniques Society (IEEE-MTT). '98 to '04 Technical Program Committee Chairman for the 2004 MTT Symposium. Activities in the IEEE Electron Devices Society (IEEE-ED). '87 to '88 ED Dallas Section Chairman. '86 to '87 ED Dallas Section Vice Chairman

RESEARCH FUNDING (over $6,000,000 total)

26. SIMULATION OF ELECTRON DYNAMICS IN AND DEVELOPMENT OF DEVICE MODELS FOR HETEROSTRUCTURE HIGH ELECTRON MOBILITY TRANSISTORS, R. L. Carter. TriQuint (formerly Texas Instruments CEMDAS membership), $90,000, 1/1/97 TO 12/31/99.
29. CENTER FOR ADVANCED ELECTRON DEVICES AND SYSTEMS (CEMDAS), Acting Director, R. L. Carter, NSF Industry/University Cooperative Research Center, $30,000, 10/1/01 to 9/31/02.
30. DEVELOPMENT OF NEXT GENERATION VLSI TECHNOLOGY FOR VERY HIGH SPEED ANALOG CHIP DESIGN, R. L. Carter and W. A. Davis, Texas Higher Education Coordinating Board Technology Development and Transfer Program, $200,000, 01/01/02 to 12/31/03. EE Department cost-sharing of $50,000, and National Semiconductor cost-sharing (see 30) $200,000.
31. DEVELOPMENT OF NEXT GENERATION VLSI TECHNOLOGY FOR VERY HIGH SPEED ANALOG CHIP DESIGN, R. L. Carter and W. A. Davis, National Semiconductor, Santa Clara, CA, $200,000, 01/01/02 to 12/31/03. Cost sharing for THECB TCT project.

PUBLICATIONS

51. V.A. Dorosinets, V.A. Samuilov, N.A. Poklonski, A. Belous, K.G. Kyritsi, A.N. Anagnostopoulos, G.L. Bleris, R.L. Carter and A.Cenys, "Electrical properties of an a-Si/Si(p)/Si(n) heterojunction device", *Semiconductor Science and Technology*, **15** No. 10 (October 2000) 980-984.
52. Mustafa Yasin Mah, S.N. Mohammad, and R.L. Carter, "Surface recombination in ion-implanted MOSFETs", *Solid-State Electron.*, **45**, Issue 12, December 2001, pp. 2039-2043.
53. A. A. Cuibotaru and R. L. Carter, "The Temperature Dependencies of the HBT Device Model", in preparation for *Solid State Electron.*
54. R. V. Pulugurta and R. L. Carter, "The Optical Response of the Silicon pin Photodiode", in preparation for *IEEE Trans, ED*.
55. E. Banatoski and R. L. Carter, "pHEMT Capacitance Simulation Using a Drift-Diffusion Regional Mobility Model", submitted 02/15/02 for publication in *IEEE Electron Devices Letters*.
56. Z.Zhu, R.L. Carter and W.A. Davis, "Simulation of the Thermal Coupling Effect in Multi-finger Bipolar Devices", Submitted 7/29/03 to *IEEE Transactions on Electron Devices*.

THESES AND DISSERTATIONS SUPERVISED

28. Anurag Lakhlani, "Device Characterization and Experimental Determination of Thermal Resistance for Dielectrically Isolated BJTs", MSEE (Thesis Option), May 2003, UTA.
29. Yuan-Piao Lee, "A Novel Method to Identify STI Quality by Using Gate Oxide Array for High Density 0.13 μm SOC", Ph.D., May 2003, UTA.
30. Karthik Subramanian, "Yield Estimation Based on Layout and Process Data", MSEE (Thesis Option), May 2003, UTA.
31. Hamish Swaminathan, "Open Circuit Limited Yield Estimation Based on Layout and Process Data", MSEE (Project Option), May 2003, UTA.
32. Piyush Thacker, "Numerical Simulations for Estimation of Thermal Resistance in Dielectrically Isolated Bipolar Junction Transistors", MSEE (Thesis Option), August 2003, UTA.
33. Siddharth Nashiney, "Compact Thermal Modeling of Dielectrically-Isolated Bipolar Junction Transistors", MSEE (Thesis Option), August 2003 UTA.
34. Swati Sahasrabudhe, "Time Dependent Thermal Measurements For Dielectric Isolated BJT", MSEE (Project Option), August 2003, UTA.
35. Ramesh Prakash, “Design of an Analog Integrated Circuit for a True Random Number Generator”, MSEE (Thesis Option), December 2003, UTA.