Lawrence E. Larson, Ph.D.
Interim Provost
Sorensen Family Dean of Engineering – Emeritus
Professor of Engineering
School of Engineering
Brown University
Providence, RI 02906
401-368-8211

Education

1996	M.B.A.(Exec.)		University of California – Los Angeles
1986	Ph.D.	Electrical Engineering	University of California – Los Angeles
1980	M. Eng.	Electrical Engineering	Cornell University
1979	B.S.	Electrical Engineering	Cornell University

Professional Appointments

1/2023 – Present Interim Provost, Brown University

The Provost is Chief Academic Officer and Chief Budget Officer for Brown University and is responsible for academic and research excellence; sound budgetary practices; and oversight for all programs in all academic departments, research centers, and interdisciplinary institutes. The annual budget for Brown is $1.5B, with 10,000 students, 1600 faculty and 3200 staff. The Provost also oversees the academic and fiscal operations of the Undergraduate College, Graduate School, Warren Alpert Medical School, School of Public Health, School of Engineering and School of Professional Studies. The Provost's Office currently is pursuing a significant expansion of Brown's research profile through increased collaborative partnerships, research funding from corporations and new strategic directions.

1/2021– Present Chairman of the Board, Slater Technology Fund, Providence, Rhode Island

The Slater Technology Fund is an evergreen not-for-profit venture development seed fund dedicated to advancing early-stage technology ventures in Rhode Island, with the overall objective of economic growth and workforce development. Slater has invested nearly $50M in recent years, with follow-on funding raised by portfolio companies close to $1B.

7/2011 – 8/2022 Sorensen Family Dean and Founding Dean, School of Engineering, Brown University and Professor of Engineering.

The Brown School of Engineering was created in 2010 from the historic Division of Engineering. I was recruited as Founding Dean in 2011, and in that role accomplished the following:

- **Growth of Faculty and Research** – Grew research funding in the School of Engineering from ~$13M/yr. in 2010 to ~$27M/yr. in 2022. Led diversification of funding sources from the NSF only to include the DoD, NIH, NIST, DoE, DoT and foundations. Doubled external corporate support for research in the SoE. Grew the tenured/tenure-track faculty from 39 FTE to 56 FTE from 2011-2022. Recruited and hired almost 50% of the current faculty in all areas of the School. Doubled the number of women faculty and recruited the first tenure-track Black and Hispanic faculty in the 150+ year history of engineering at Brown University.

- **Fundraising, Design and Construction of New Engineering Research Building** – Led the fundraising, design, architect selection, planning and construction of $88M, 80,000 sq. ft. laboratory building, doubling the research capacity of the School of Engineering. The building was occupied in Oct. 2017 (four months ahead of schedule). The design process was highly collaborative, involving input from students, staff and faculty; and the results have been outstanding – a highly functional building that invites collaboration and engagement with the community. The design and execution were so innovative that it was one of only five buildings in the nation chosen for the annual *Architectural Record* "Colleges and Universities" issue in Nov2018. This was the first new engineering building in over 50 years on the Brown campus.

- **Growth of Fundraising** – Built the entire School of Engineering fundraising organization "from scratch," including alumni outreach, targeted communications, campaign development, and donor engagement. Led the team that raised over $160M as of 10/2022, including entire funding of an $88M laboratory building, and gifts/pledges for ten endowed Chairs and the Nelson center for Entrepreneurship. Increased the number of annual donors to Brown engineering from ~30 per year in 2011 to over 600 per year in 2022.

- **Growth of the Graduate Program –** Dramatically increased the size of the Engineering Master's degree program, from 40 students per year to nearly 200 students per year) led PhD program growth of roughly 30%; and created three successful new Master Programs:

    - Master in Technology Leadership (MTL) – Led the development and launch (March 2017) of the Brown Master in Technology Leadership. This "blended" transformational executive course provides leadership training for mid-career professionals in science and technology, grounded in an ethos of liberal learning with a global perspective.

    - Joint Brown-Rhode Island School of Design (RISD) Master Program in Design Engineering (MADE) - Led the creation of the first joint Brown-RISD degree program in the history of the two institutions. This unique program brings together the strengths of the two institutions to train students in the emerging field of Design Engineering. The first cohort started in June of 2021.

    - Master in Data-Enabled Computational Engineering and Science (DECES). - Created a program that provides students with understanding of the significant role that advanced data-driven simulation plays in industry and national laboratories. Students gain technical knowledge of the foundational subjects in computational engineering, including nonlinear finite element analysis and the integration of machine learning and data science. The first cohort started in June of 2022

- **Creation of Innovative Co-Curricular Programs**

    - Led the creation of the Brown Design Workshop (BDW) – one of the leading "maker spaces" in the nation, which has over 1,800 members from Brown and RISD and occupies over 8,000 square feet of workspace. The BDW is a campus hub for innovation, entrepreneurship, hacking and exploring new ideas. Faculty and students from across the campus use the Brown Design Workshop and it is an integral part of courses taught in engineering (8 courses), computer science, visual arts, music, English, history of art and architecture, and American studies.

    - Led the creation of the Nelson Center for Entrepreneurship – which coordinates and enables entrepreneurial efforts in all areas of campus: science, technology, the arts, social sciences,

graduate, undergraduate and faculty. Developed the initial proposal as part of a multi-year campus-wide planning, which resulted in a $25M gift, recruitment of a founding director and launch of the Center in fall 2015.

- Rejuvenation of Student Organizations in the School of Engineering – Doubled funding for student co-curricular funding from 2011-2018, in support of 17 student organizations. Led the efforts to create Brown student chapters of National Society for Black Engineers (NSBE) and Society of Hispanic Professional Engineers (SHPE), which are thriving and serve as important support networks.

- **Creation of a Supportive Environment for Diversity, Equity and Inclusion**

  - Faculty – Initiated a vigorous program for recruiting and retaining a more diverse faculty in engineering. We more than doubled the number of women faculty in engineering, recruited two Black faculty (the first two in Brown engineering history) and three Hispanic faculty members. We fundraised for the first endowed Chairs in Brown's history for three of our distinguished women faculty.

  - Graduate Students – We created one of the most diverse engineering student bodies in American academia. ASEE reported in 2017 that the gender balance of our MS program was the best in the nation. The gender balance of our PhD program is roughly 34% women compared to the national average of roughly 20%. We more than doubled the diversity of our PhD population from historically underrepresented groups (from 3% to 7%).

  - Undergraduate Students – We created a welcoming and supportive environment for all students, and increased the fraction of undergraduates from diverse backgrounds from 10% in 2012 to 28% in 2018 (tops in the Ivy League). And the gender balance has risen to well over 40%. Both of these figures are roughly double the national average.

- **Enhanced Operational Excellence**

  - New Business Model - I developed a completely new business model for the School of Engineering - creating greater incentives for research excellence, more efficient use of research space, and transparent and collaborative budget planning. We did this while maintaining the close and collaborative ties between the School of Engineering and the rest of Brown, and maintained a budget surplus during all subsequent years of operation.

  - School of Engineering Strategic Plan – Developed new five-year plan for the School of Engineering in 2015. Engaged all stakeholders (faculty, staff, alums, industry partners, administration, students) to develop a complete vision of the direction for the School. Identified key areas for School growth and new technical directions for collaborative research at Brown.

  - Staff Reorganization – conducted a thorough staff review and overhaul of the entire School of Engineering in 2013-2014. Realigned administrative responsibilities, removed redundancies, improved customer service and reduced costs.

- **Developed External Partnerships** – Created the School of Engineering Industrial Advisory Board (IAB), with roughly 20 members. The IAB provides strategic advice for the School, research

engagement with our faculty, and job and internship opportunities for our students. Created an annual Engineering Career Fair to provide networking and career opportunities for engineering students.

7/2011 – Present Professor of Engineering – Brown University

My research program at Brown University developed integrated circuits and systems for next-generation wireless brain-computer interfaces. Early versions of these devices are in clinical trials; recent versions have achieved unprecedented data rates and functionality. During my career: published ~400 papers in journals, refereed conference proceedings, graduated 31 PhD students, received 43 US patents, and earned a current H-index of 72 (Google Scholar).

7/2007 - 7/2011 Chair, Department of Electrical and Computer Engineering (ECE) – University of California – San Diego, Jacobs School of Engineering

The ECE Department at UCSD is the largest graduate program on the UCSD campus, with over $25M in funding (2011), 500 graduate students and 600 undergraduates.

- Oversaw faculty development (hiring, promotion and tenure process), educational policy and teaching, a successful accreditation review, resource allocation, and external relations (including fundraising for one endowed chair).

- Led the development (with Computer Science) of the new Executive Master of Advanced Study in Embedded Wireless Systems program.

7/2001 -7/2006 Director – UCSD Center for Wireless Communications

The UCSD Center for Wireless Communications is the largest industry-funded university research centers in the nation. The CWC conducts research in all areas of wireless communications, from fundamental devices and materials to software applications

- I supported the work of over 20 professors and roughly 50 PhD graduate students per year during my tenure, and with an annual budget in excess of $3M..

- During my tenure as Director we received support from more than 18 corporate members - both domestic and international. I was responsible for all aspects of the Center, from new member development and fundraising, to financial management and establishing the research direction.

7/1996 - 7/2011 CWC Industry Chair Professor in Wireless Communications, Department of Electrical and Computer Engineering, University of California - San Diego.

Research Program at UCSD for Professor Larson:

- I developed improved integrated circuit techniques and novel semiconductor device structures for wireless communications applications. This required development of high-frequency integrated circuits, devices, and packaging techniques for ultra-wide bandwidth telecommunications applications, and development of novel data converter and analog-signal

processing architectures that are matched to communications applications. Many of these technologies were licensed to commercial wireless companies.

- Graduated 30 UCSD PhD students since arriving at UCSD in 1996. Published over 350 papers during this period and over 40 US patents.

2004-2005 **Distinguished Visiting Professor – TU Delft, Netherlands** (on sabbatical from UCSD)

Developed novel new microwave tuning technology, with unparalleled linearity and performance

2000-2001 **Director – IBM Research West Coast Design Center of Excellence** (on leave from UCSD)

- Led the international team that developed a complete Wideband CDMA chip set for several "first tier" cellular telephone providers, in partnership with Mitsubishi Electric, Osaka, Japan
- Directed development of SiGe Radio Frequency ICs for third-generation wireless cellular applications

1994-1996 **Manager, Telecommunications Technology Department, Microwave Devices and Circuits Laboratory, Hughes Research Laboratories, Malibu, CA**

- Directed research and development of integrated circuits for commercial RF and microwave communications applications, including DBS, cellular telephone, Very Small Aperture Terminal (VSAT) and PCS

- At Hughes Network Systems (Germantown, MD), I led the development of an RFIC design center for communications applications, including the first high volume DirecTV satellite receiver

- Responsible for the technical direction of the corporate partnership with IBM on Si/SiGe HBT technology. This partnership led to multiple system insertions in defense and commercial systems in subsequent years.

- Led the team that demonstrated the first microwave ICs in SiGe HBT technology (amplifiers, mixers, VCOs, frequency dividers) in the 5-25 GHz frequency range.

1988 – 1994 **Manager, HEMT Technology Department, Microwave Devices and Circuits Laboratory, Hughes Research Laboratories, Malibu, CA**

Directed research in high-speed III-V materials, devices, and circuits, and was responsible for approximately $4M/yr. in Corporate IR&D and Government Research Contracts.

- Developed the first space-qualified InP low-noise millimeterwave HEMT. This effort was awarded the 1996 Lawrence Hyland Award - the highest technical achievement award at Hughes Electronics. These devices are still used in defense satellite crosslink communications systems.

- Developed the first micromachining (RFMEMS) switch and tuner applications for RF and microwave applications (1991). This technology has now become an extremely active area of worldwide research and development, is a common feature in many high-end cellular telephones, and I hold many fundamental patents in the field. The market for RF MEMS devices now exceeds $1B (FY22)

- I established and ran a state-of-the-art InP HEMT MMIC foundry at HRL – from materials growth, lithography, device fabrication, process development, packaging and text. Devices and circuits from this foundry had many aerospace and research system insertions, and the foundry continues operation today.

- Developed some of the first advanced RF/Microwave CMOS technology with performance comparable to III-V technology (1991).

- Directed the research program that demonstrated HEMTs with record fT's and fMAX's above 300 GHz (1993). This produced the highest frequency room temperature integrated circuit ever reported - a 210 GHz VCO (1994).

1992– 1994 Assistant Manager - DARPA / Hughes MIMIC Program

Responsible for Program Management of Advanced Technology Portion of DARPA/Hughes MIMIC Program, with a budget of approximately $8M/yr. I led the systems insertions research roadmap of GaAs PHEMT and MESFET technology into airborne phased-array radar applications.

1988 – 1992 Adjunct Associate Professor – UCLA

Responsible for senior level digital and analog integrated circuit design courses and graduate analog MOS integrated circuit design course; supervised student PhD research

1980– 1988 Member of Technical Staff, Hughes Research Laboratories, Malibu, CA

Responsible for development of CMOS and III-V analog and digital integrated circuits, modeling and characterization of MESFETs and HEMTs, and development of improved III-V process techniques.

Primary Published Work

Refereed Journal Articles

1 W. W. Cheng and L. E. Larson, "A Low-Frequency CMOS Triangle Wave Generator", IEEE J. Solid-State Circuits, SC-20 (2), 649-652 (1985).
2 L. E. Larson, R. J. Burns, M. E. Levy, and W. W. Cheng, "An Analog CMOS Autopilot", IEEE J. Solid-State Circuits, SC-20 (2), 571-578 (1985).
3 L. E. Larson, J. F. Jensen, and P. T. Greiling, "GaAs High-Speed Digital IC Technology: An Overview", (invited) IEEE Computer – special issue on GaAs computer architecture, pp. 85-94 (1986).
4 L. E. Larson, G. C. Temes, and S. Law, "Comparison of Amplifier Gain Enhancement Techniques for GaAs MESFET Analogue Integrated Circuits", Electronic Letters, 22 (21), 1138-1139 (1986).
5 L. E. Larson and G. C. Temes, "Switched-Capacitor Gain Stage with Reduced Sensitivity to Finite Amplifier Gain and Offset Voltage", Electronic Letters, 22 (24), 1281-1283 (1986).
6 L. E. Larson, "An Improved GaAs MESFET Equivalent Circuit Model for Analog Integrated Circuit Applications", IEEE J. of Solid-State Circuits, SC-22 (4), 567-574 (1987).
7 L. E. Larson, K. W. Martin, and G. C. Temes, "GaAs Switched-Capacitor Circuits for High-Speed Signal Processing", IEEE J. of Solid-State Circuits, SC-22 (6), 971-981 (1987).
8 L. E. Larson, T. Cataltepe, and G. C. Temes, "Multibit Oversampled ∑-Δ A/D Converter With Digital Error Correction", Electronics Letters, 24 (16), 1051-1052 (1988).
9 L. E. Larson, C. S. Chou, and M. J. Delaney, "An Ultrahigh-Speed GaAs MESFET Operational Amplifier", IEEE J. Solid-State Circuits, 24 (6), 1523-1528 (1989).
10 A S. Brown, U. K. Mishra, C. S. Chou, C. E. Hooper, M. A. Melendes, M. Thompson, L. E. Larson, S. E. Rosenbaum, and M. J. Delaney, "AlInAs-GaInAs HEMTs Utilizing Low-Temperature AlInAs Buffers Grown by MBE", IEEE Electron Devices Letters, 10 (12), 565-567 (1989).
11 M. J. Delaney, C. S. Chou, L. E. Larson, J. F. Jensen, D. S. Deakin, A. S. Brown, W. W. Hooper, M. A. Thompson, L. G. McCray, and S. E. Rosenbaum, "Low-Temperature Buffer GaAs MESFET Technology for High-Speed Integrated Circuit Applications", IEEE Electron Device Letters, 10 (8), 355-357 (1989).
12 R. H. Walden, A. E. Schmitz, A. R. Kramer, L. E. Larson, and J. Pacsiecznik, "A Deep-Submicrometer Analog-to-Digital Converter Using Focused Ion Beam Implants", IEEE J. of Solid-State Circuits, 25 (2), 562-571 (1990).
13 A. E. Schmitz, R. H. Walden, L. E. Larson, S. E. Rosenbaum, R. A. Metzger, J. R. Behnke, and P. A. MacDonald, "A Deep –Submicrometer Microwave/Digital CMOS/SOS Technology", IEEE Electron Device Letters, 12 (1), 16-17 (1991).
14 G. M. Atkinson, R. L. Kubena, L. E. Larson, L. D. Nguyen, F. P. Stratton, L. M. Jelloian, M. V. Le, and H. McNulty, "Self-Aligned High Electron Mobility Transistor Gate Fabrication Using Focused Ion Beams, J. Vac. Sci. Technol. B, 9 (6), 3506-3510 (1991).
15 L. D. Nguyen, A. S. Brown, M. A. Thompson, L. M. Jelloian, L E. Larson, and M. Matloubian, "650-Å Self-Aligned-Gate Pseudomorphic Al0.48In0.52As/Ga0.20In0.80As High Electron Mobility Transistors", IEEE Electron Device Letters, 13 (3), 143-145 (1992).
16 L. D. Nguyen, L. E. Larson, and U. K. Mishra, "Ultra-High-Speed Modulation-Doped Field-Effect Transistors: A Tutorial Review", (Invited) Proc. Of the IEEE, 80 (4), 494-518 (1992).
17 A. S. Brown, J. A. Henige, A. E. Schmitz, and L. E. Larson, "Effect of Growth Conditions on the Electrical and Optical Properties of AlxIn1-xAs (0.48 < x < 0.7)-Ga0.47In0.53As Heterostructures", Applied Physics Letters, 62 (1), 66-68 (1993).
18 M. Matloubian, A. S. Brown, L. D. Nguyen, M. A. Melendes, L. E. Larson, M. J. Delaney, J. E. Pence, R. A. Rhodes, M. A. Thompson, and J. A. Henige, "High-Power V-Band AlInAs/GaInAs on InP HEMTs", IEEE Electron Device Letters, 14 (4), 188-189 (1993).
19 J. J. Brown, A. S. Brown, S. E. Rosenbaum, A. S. Schmitz, M. Matloubian, L. E. Larson, M. A. Melendes, and M. A. Thompson, "Study of the Dependence of Ga0.47In0.53As/AlxIn1-xAs Power HEMT Breakdown

Voltage on Schottky Layer Design and Device Layout", IEEE Transactions on Electron Devices, 40 (11), 2111-2112 (1993).

20 M. Matloubian, L. M. Jelloian, T. Liu, M. Lui, L. Larson, L. Nguyen, and M. Le, "GaInAs/InP Composite Channel HEMTs", IEEE Transactions on Electron Devices, 40 (11), 2112 (1993).

21 L. E. Larson, M. Matloubian, J. J. Brown, A. S. Brown, R. A. Rhodes, D. Crampton, and M. A. Thompson, "AlInAs/GaInAs on InP HEMTs for Low Power Supply Voltage Operation of High Power-Added Efficiency Microwave Amplifiers", Electronic Letters, 29 (15), 1324-1326 (1993).

22 S. E. Rosenbaum, L. M. Jelloian, L. E. Larson, U. K. Mishra, D. A. Pierson, M. A. Thompson, T. Liu, and A. S. Brown, "A 2 GHz Three Stage AlInAs-GaInAs-InP HEMT MMIC Low-Noise Amplifier", IEEE Microwave and Guided Wave Letters, 3 (8), 265-267 (1993).

23 M. Matloubian, A. S. Brown, L. D. Nguyen, M. A. Melendes, L. E. Larson, M. J. Delaney, R. A. Rhodes, M. A. Thompson, R. A. Rhodes, and J. E. Pence, "20-GHz High-Efficiency AlInAs-GaInAs on InP Power HEMT", IEEE Microwave and Guided Letters, 3 (5), 142-144 (1993).

24 L. Larson, L. Jelloian, S. Rosenbaum, A. Schmitz, M. Thompson, M. Lui, L. Nguyen, and U. Mishra, "Manufacturing Study of Yield and Performance Dependence on Gate Length for Submicron AlInAs-GaInAs HEMTs", IEEE Transactions on Semiconductor Manufacturing, 6 (4), 380-383 (1993).

25 M. Matloubian, L. M. Jelloian, A. S. Brown, L. D. Nguyen, L. E. Larson, M. J. Delaney, M. A. Thompson, R. A. Rhodes, and J. E. Pence, "V-Band High-Efficiency High-Power AlInAs/GaInAs/InP HEMTs", IEEE Transactions on Microwave Theory and Techniques, 41 (12), 2206-2210 (1993).

26 W. Lam, M. Matloubian, A. Kurdoghlian, L. Larson, C. Chou, L. Jelloian, A. Brown, M. Thompson, and C. Ngo, "High-Efficiency InP-Based HEMT MMIC Power Amplifier for Q-band Applications", IEEE Microwave and Guided Wave Letters, 3 (11), 420-422 (1994).

27 S. E. Rosenbaum, B. K. Kormanyos, L. M. Jelloian, M. Matloubian, A. S. Brown, L. E. Larson, L. D. Nguyen, M. A. Thompson, L. P.B. Katehi, and G. M. Rebeiz, "155- and 213- GHz AlInAs/GaInAs/InP HEMT MMIC Oscillators", IEEE Transactions on Microwave Theory and Techniques, 43 (4), 927-932 (1995).

28 W. Lam, M. Matloubian, A. Igawa, C. Chou, A. Kurdoghlian, C. Ngo, L. Jelloian, A. Brown, M. Thompson, and L. Larson, "44-GHz High-Efficiency InP-HEMT MMIC Power Amplifier", IEEE Microwave and Guided Wave Letters, 4 (8), 277-278 (1994).

29 K. Kaviani, A. Madhukar, J. J. Brown, and L. E. Larson, "Realisation of Doped-Channel MISFETs with High Breakdown Voltage in AlGaAs/InGaAs Based Material System". Electronic Letters, 30 (8), 669-670 (1994).

30 Lawrence E. Larson, "Integrated Circuit Technology Options for RFIC's – Present Status and Future Directions", J. Solid-State Circuits, vol. 33, no. 3, pp. 387-399, (March 1998).

31 Lawrence E. Larson, "Applications of Advanced Si/SiGe Technology for High-Frequency Communications Systems", J. Vac. Sci. Techn. B., 16 (3), 1541-1548, (1998).

32 A. Jayaraman, P. Chen, G. Hanington, L. Larson, and P. Asbeck, "Linear High-Efficiency Microwave Power Amplifiers Using Bandpass Delta-Sigma Modulators", IEEE Microwave and Guided Wave Letters, 8 (3), 121-123, (1998).

33 L. Larson, "Radio Frequency Integrated Circuit Technology", IEEE Personal Communications Magazine, Vol 5, no. 3, pp. 11-19, (June 1998).

34 R. Langridge, T. Thornton, P. Asbeck, and L. Larson, "A Power Re-Use Technique for Improved Efficiency of Outphasing Microwave Power Amplifiers," IEEE Transactions on Microwave Theory and Techniques, August 1999, Vol. 47, No. 8, pp. 1467-1471.

35 G. Hanington, P.F. Chen, P. Asbeck, and L. Larson, "High-Efficiency Power Amplifier Using Dynamic Power-Supply Voltage for CDMA Applications," IEEE Transactions on Microwave Theory and Techniques, August 1999, Vyol. 47, No. 8, pp. 1471-1476.

36 L.C.N. de Vreede, H.C. de Graaff, J.A. Willenmen, W. van Noort, H.F.F. Jos, L.E. Larson, J.W. Slotboom and J.L. Tauritz, "Bipolar Transistor Epilayer Design Using the MAIDS Mixed Level Simulator," IEEE Journal of Solid-State Circuits, vol. 34, pp. 1331-1338, no. 34, Sept. 1999.

37 L. Larson, P. Asbeck, G. Hanington, E. Chen, A. Jayamaran, R. Langridge, and Xuejun Zhang, "Device and Circuit Approaches for Improved Wireless Communications Transmitters," IEEE Personal Communications, vol. 6, no.5, pp. 18-23, Oct. 1999.
38 M. Sushchik, N. Pulkov, L. Larson, L. Tsimring, H. Abarbanel, K. Yao, and A. Volkovskii, "Chaotic Pulse Position Modulation: A Robust Method of Communicating with Chaos," IEEE Communication Letters, vol. 4, no. 4, pp. 128-130, April 2000.
39 X. Zhang and L. Larson, "Gain and Phase Error-Free LINC Transmitter," IEEE Transactions on Vehicular Technology, vol. 49, no. 5, pp. 1986-94, Sept. 2000.
40 L. Sheng, J.C. Jensen, and L. Larson, "A wide-bandwidth Si/SiGe HBT direct conversion sub-harmonic mixer/downconverter," IEEE Journal of Solid-State Circuits, vol. 35, no. 9, pp. 1329-1337, Sept. 2000.
41 G. Niu, S. Zhang, J.D. Cressler, A. Joseph, J. Fairbanks, L. Larson, C. Webster, W.E. Ansley, D.L. Harame, "Noise parameter modeling and SiGe profile design tradeoffs for RF applications (HBT's)." IEEE Transactions on Electron Devices, vol. 47, no. 11, pp. 2037-2044, Nov. 2000.
42 D.C. Laney, L. Larson, P. Chan, J. Malinowski, D. Harame, S. Subbanna, R. Volant, M. Case, "Microwave transformers, inductors, and transmission lines implemented in a Si/SiGe HBT process," IEEE Transactions on Microwave Theory & Techniques. Aug. 2001, pp. 1507-1510
43 J.C. Jensen and L. Larson, "A broadband 10 GHz track-and-hold in Si/SiGe HBT technology," IEEE Journal of Solid-State Circuits, vol. 36, pp. 325-330, March 2001.
44 M. Iwamoto, A. Jayaraman, G. Hanington, P.F. Chen, A. Bellora, W. Thornton, L. Larson, and P. Asbeck, "Bandpass delta-sigma Class-S amplifier," Electronic Letters, vol. 36, no. 12, pp. 1010-1012, June 2000.
45 W.T. Thornton and L. Larson, "An improved 5.7 GHz ISM-band feedforward amplifier utilizing vector modulators for phase attenuation control," Microwave Journal, vol. 42, no. 12, pp. 96,98,102,104,106, Dec. 1999.
46 X. Zhang, L. Larson, and P. Asbeck, "Calibration scheme for LINC transmitter," Electronics Letters, vol. 37, no. 5, pp. 317-318, March 2001.
47 X. Zhang, L. Larson, P. Asbeck, and P. Nanawa, "Gain/Phase Imbalance-Minimization Techniques for LINC Transmitters," IEEE Transactions On Microwave Theory and Techniques, vol. 49, no. 12, pp. 2507-2516, December 2001.
48 P. Asbeck, L. Larson, and I. Galton, "Synergistic Design of DSP and Power Amplifiers for Wireless Communications," IEEE Transactions On Microwave Theory and Techniques, vol. 49, no. 11, pp. 2163-2169, November 2001.
49 M. Iwamoto, A. Williams, P.-F. Chen, A. Metzger, L. Larson, and P. Asbeck, "An Extended Doherty Amplifier with High Efficiency over a Wide Power Range," IEEE Transactions On Microwave Theory and Techniques, vol. 49, no. 12, pp. 2472-2479, December 2001.
50 M. Vaidyanathan, M. Iwamoto, L. Larson, P. Gudem, and P. Asbeck, "A Theory of High-Frequency Distortion in Bipolar Transistors," IEEE Transactions On Microwave Theory and Techniques, vol. 51, no. 2, Feb, 2003., pp 278-293.
51 D. Jessie and L. Larson, "An improved leaded small outline package and equivalent circuit," IEEE Microwave and Wireless Components Letters, Volume 13, Issue 7, July 2003 Pp.:273 – 275 (From A.I.58)
52 D. Jessie and L. Larson "Conformal mapping for buried CPW with finite grounds." Electronics Letters, vol.37, (no.25), IEE, 6 Dec. 2001. p.1521-3.
53 X. Zhang, L. Larson, P. Asbeck, and R. Langridge, "Analysis of Power Recycling Techniques for RF and Microwave Outphasing Power Amplifiers," IEEE Transactions on Circuits & Systems II-Analog & Digital Signal Processing, vol.49, no.5, May 2002, pp.312-20.
54 D. Laney, G. Mario Maggio, F. Lehmann, and L. Larson , "Multiple Access for UWB Impulse Radio with Pseudo-Chaotic Time Hopping," IEEE Journal on Selected Areas in Communications, December 2002, pp. 1692-1700.
55 S. Subbanna, G. Freeman, G.; Jae-Sung Rieh; Ahlgren, D.; Stein, K.; Dickey, C.; Mecke, J.; Bacon, P.; Groves, R.; Meghelli, M.; Soyuer, M.; Jagannathan, B.; Schonenberg, K.; Shwu-Jen Jeng; Joseph, A.; Coolbaugh, D.; Volant, R.; Greenberg, D.; Huajie Chen; Brelsford, K.; Harame, D.; Dunn, J.; Larson, L.; Herman, D., Jr.; Meyerson, B. , "50-200 GHz silicon-germanium heterojunction bipolar transistor BICMOS technology and a computer-aided design environment for 2-50+ GHz very large-scale integration mixed-

signal IC's," . Japanese Journal of Applied Physics, Part 1, vol.41, (no.2B), Japan Soc. Appl. Phys, Feb. 2002. p.1111-23.
56 D. Jessie and L. Larson, "An X-band small outline leaded plastic package for MMIC applications," IEEE Transactions on Advanced Packaging, vol.25, no.3, Aug. 2002, pp.439-47.
57 V. Aparin and L. Larson, "Analysis and Reduction of Cross-Modulation Distortion in CDMA Receivers," IEEE Transactions On Microwave Theory and Techniques, vol.51, no.5, May 2003, pp.1591-602.
58 R. Tenny, L. Tsimring, L. Larson and H Abarbanel, "Using distributed nonlinear dynamics for public key encryption," Physical Review Letters, vol.90, no.4, 31 Jan. 2003, pp.047.
59 L. Larson, "Silicon Technology Tradeoffs for Radio-Frequency/Mixed-Signal "Systems-on-a-Chip" (Invited Paper)" IEEE Transactions on Electron Devices, vol.50, no.3, March 2003, pp.683-9.
60 L. Sheng and L. Larson, "An SiGe BiCMOS Direct-Conversion Mixer with 2nd-Order and 3rd-Order Nonlinearity Cancellation for WCDMA Applications" IEEE Transactions On Microwave Theory and Techniques, Volume: 51 , Issue: 11 , Nov. 2003.
61 D.Y.C. Lie and L.E. Larson, "RF-SoC: Technology Enablers and Current Design Trends for Highly Integrated Wireless RF IC Transceivers," International Journal of Wireless and Optical Communications, Vol. 1, No. 1, (2003) pp. 1-23.
62 D. Mahli, L. Larson, Dawn Wang, C. Demirdag, and V. Pereira, "SiGe W-CDMA Transmitter For Mobile Terminal Application" IEEE Journal of Solid-State Circuits, Volume 38, Issue 9, Sept. 2003 Pp.:1570 – 1574
63 J. Jensen and L. Larson, "A 16GHz Ultra High-Speed Si/SiGe HBT Comparator," IEEE Journal of Solid-State Circuits, Volume 38, Issue 9, Sept. 2003 Pp.:1584 – 1589
64 V. Leung, L. Larson and P. Gudem, "An Improved Digital-IF Transmitter Architecture for Highly-Integrated W-CDMA Mobile Terminals," IEEE Transactions on Vehicular Technology, Volume 54, Issue 1, Jan. 2005 Pp.:20 – 32
65 V. Leung, L. Larson, and P. Gudem, "Digital-IF WCDMA Handset Transmitter IC in 0.25um SiGe BiCMOS," IEEE Journal of Solid-State Circuits. Volume 39, Issue 12, Dec. 2004 Pp.:2215 – 2225
66 C. Wang, M. Vaidyanathan and L. Larson, "A Capacitance Compensation Technique for Improved Linearity in CMOS Class-AB Power Amplifiers," IEEE Journal of Solid-State Circuits, Volume 39, Issue 11, Nov. 2004 Pp.:1927 – 1937.
67 V. Aparin and L. Larson, "Modified Derivative Superposition Method for Linearizing FET Low-noise Amplifiers," IEEE Transactions on Microwave Theory and Techniques, Volume 53, Issue 2, Feb. 2005 Pp.:571 – 581
68 F. Wang, A. Yang, D. Kimball, L. Larson, and P. Asbeck, "Design of Wide Bandwidth Envelope Tracking Power Amplifiers for OFDM Applications," IEEE Transactions on Microwave Theory and Techniques, Volume 53, Issue 4, April 2005 Pp.:1244 – 1255.
69 J. Deng, P. Gudem, L. Larson, and P. Asbeck, "High-Average-Efficiency SiGe HBT Power Amplifier for WCDMA Handset Applications," IEEE Transactions on Microwave Theory and Techniques. Volume 53, Issue 2, Feb. 2005 Pp.:529 – 537
70 V. Leung, J. Deng, P. Gudem, and L. Larson, "Analysis of Envelope Signal Injection for Improvement of RF Amplifier Intermodulation Distortion", IEEE Journal of Solid-State Circuits, Volume 40, Issue 9, Sept. 2005 Pp.:1888 – 1894 From In Press
71 K. Gard, L. Larson, and M. Steer, "The Impact of RF Front-End Characteristics on the Spectral Regrowth of Communications Signals, IEEE Transactions on Microwave Theory and Techniques, Volume 53, Issue 6, Part 2, June 2005, pp. 2179 – 2186
72 Wang, F.; Kimball, D. F.; Popp, J. D.; Yang, A. H.; Lie, D. Y.; Asbeck, P. M.; Larson, L. E., "An Improved Power-Added Efficiency 19-dBm Hybrid Envelope Elimination and Restoration Power Amplifier for 802.11g WLAN Applications," , IEEE Transactions on Microwave Theory and Techniques, Volume 54, Issue 12, Part 1, Dec. 2006 Pp.:4086 – 4099
73 Neo, W.C.E.; Lin, Y.; Liu, X.-D.; De Vreede, L.C.N.; Larson, L.E.; Spirito, M.; Pelk, M.J.; Buisman, K.; Akhnoukh, A.; De Graauw, A.; Nanver, L.K.; "Adaptive Multi-Band Multi-Mode Power Amplifier Using Integrated Varactor-Based Tunable Matching Networks," IEEE Journal of Solid-State Circuits Volume 41, Issue 9, Sept. 2006, pp. 2166 – 2176

74 Junxiong Deng; Gudem, P.S.; Larson, L.E.; Kimball, D.F.; Asbeck, P.M.; "SiGe PA with dual dynamic bias control and memoryless digital predistortion for WCDMA handset applications," IEEE Journal of Solid-State Circuits, Volume 41, Issue 5, May 2006 Pp.:1210 – 1221
75 Ranjan, M.; Larson, L. E.; "Distortion Analysis of Ultra-Wideband OFDM Receiver Front-Ends," IEEE Transactions on Microwave Theory and Techniques, Volume 54, Issue 12, Part 2, Dec. 2006 Pp.:4422 – 4431
76 Kimball, D.F.; Jeong, J.; Hsia, C.; Draxler, P.; Lanfranco, S.; Nagy, W.; Linthicum, K.; Larson, L.E.; Asbeck, P.M.; "High-Efficiency Envelope-Tracking W-CDMA Base-Station Amplifier Using GaN HFETs" IEEE Transactions on Microwave Theory and Techniques, Volume 54, Issue 11, Nov. 2006 Pp.:3848 – 3856
77 Mahim Ranjan; Larson, L.E.;"A Low-Cost and Low-Power CMOS Receiver Front-End for MB-OFDM Ultra-Wideband Systems, IEEE J. of Solid-State Circuits, Volume 42, Issue 3, March 2007 Pp.:592 – 601
78 L. Larson, "Technology Enablers for Software-Defined Radios," IEICE Transactions, Vol.E89-B No.12 pp.3174-3178, 2007. Invited Journal Article
79 Buisman, K.; de Vreede, L. C. N.; Larson, L. E.; Spirito, M.; Akhnoukh, A.; Lin, Y.; Liu, X.; Nanver, L. K.; "A Monolithic Low-Distortion Low-Loss Silicon-on-Glass Varactor-Tuned Filter With Optimized Biasing," IEEE Microwave and Wireless Components Letters, Volume 17, Issue 1, Jan. 2007 Pp.:58 – 60
80 Feipeng Wang; Kimball, D.F.; Lie, D.Y.; Asbeck, P.M.; Larson, L.E.; "A Monolithic High-Efficiency 2.4-GHz 20-dBm SiGe BiCMOS Envelope-Tracking OFDM Power Amplifier," IEEE J. of Solid-State Circuits, Volume 42, Issue 6, June 2007 Pp.:1271 – 1281.
81 Jamp, J.I.; Larson, L.E., "A Coding Technique for the Spectral Shaping of Ultra-Wideband Time-Hopping Signals," IEEE Transactions on Vehicular Technology, Volume 56, Issue 4, Part 1, July 2007 pp.:1671 – 1682
82 T. Hung, D. Choi, L. Larson, and P. Asbeck, "CMOS Outphasing Class-D Amplifier With Chireix Combiner," IEEE Microwave and Wireless Components Letters, Volume 17, Issue 8, Aug. 2007, pp. 619 – 621.
83 Khatri, H.; Gudem, P. S.; Larson, L. E.; "Integrated RF Interference Suppression Filter Design Using Bond-Wire Inductors," IEEE Transactions on Microwave Theory and Techniques, Volume 56, Issue 5, Part 1, May 2008 Pp.:1024 – 1034
84 Kodkani, R. M.; Larson, L. E. "A 24-GHz CMOS Passive Subharmonic Mixer/Downconverter for Zero-IF Applications," IEEE Transactions on Microwave Theory and Techniques, Volume 56, Issue 5, Part 2, May 2008 Pp.:1247 – 1256.
85 C. Huang, L. De Vreede, F. Sarubbi, M. Popadic, K. Buisman, J. Qureshi, M. Marchetti, A. Akhnoukh, T. Scholtes, L. Larson, L. Nanver, "Enabling Low-Distortion Varactors for Adaptive Transmitters IEEE Transactions on Microwave Theory and Techniques, Volume 56, Issue 5, Part 1, May 2008 Pp.:1149 – 1163.
86 T. Hung, J. Rode, , L. Larson and P. Asbeck, "Design of H-Bridge Class-D Power Amplifiers for Digital Pulse Modulation Transmitters," IEEE Transactions on Microwave Theory and Techniques, Volume 55, Issue 12, Part 2, Dec. 2007 pp. 2845 – 2855.
87 C. Huang, K. Buisman, L. Nanver, F. Sarubbi, M. Popadić, T. Scholtes, H. Schellevis, L. Larson, and L. de Vreede, "A 67 dBm OIP3 Multi-stacked Junction Varactor," IEEE Microwave and Wireless Components Letters, Vol. 18, Issue: 11, 2008 , pp. 749 – 751
88 M. Farazian, P. Gudem, L. Larson, "A CMOS Multi-Phase Injection-Locked Frequency Divider for V-Band Operation," IEEE Microwave and Wireless Components Letters, Vol. 19 , Issue 4, 2009 , pp. 239 – 241.
89 H. Khatri, P. Gudem, L. Larson, "Distortion in Current Commutating Passive CMOS Downconversion Mixers," IEEE Transactions on Microwave Theory and Techniques, Volume: 57 , Issue: 11, 2009 , pp. 2671 – 2681
90 J. Jeong, D. Kimball, M. Kwak; P. Draxler, C. Hsia; C. Steinbeiser, T. Landon, O. Krutko, L. Larson, P. Asbeck, "High-Efficiency WCDMA Envelope Tracking Base-Station Amplifier Implemented With GaAs HVHBTs," IEEE Journal of Solid-State Circuits, Vol.: 44 , Issue: 10, 2009 , pp. 2629 – 2639

91 N. Kim, L. Larson, V. Aparin, “A Highly Linear SAW-Less CMOS Receiver Using a Mixer With Embedded Tx Filtering for CDMA,” IEEE Journal of Solid-State Circuits, Volume: 44 , Issue: 8, 2009 , pp. 2126 – 2137
92 C. Huang, K. Buisman, M. Marchetti, L. Nanver, F. Sarubbi, M. Popadic, T. Scholtes, H. Schellevis, L. Larson, L. de Vreede, “Ultra Linear Low-Loss Varactor Diode Configurations for Adaptive RF Systems,” IEEE Transactions on Microwave Theory and Techniques, Vol. 57 , Issue: 1, 2009 , pp. 205 – 215
93 N. Kim, V. Aparin, L. Larson, “A Resistively Degenerated Wideband Passive Mixer With Low Noise Figure and High IIP3,” IEEE Transactions on Microwave Theory and Techniques, Vol: 58 , Issue: 4, 2010, pp. 820 – 830
94 M. Farazian, P. Gudem, L. Larson, “Stability and Operation of Injection-Locked Regenerative Frequency Dividers,” IEEE Transactions on Circuits and Systems I: Regular Papers, 2010, Volume: 57 , Issue: 8, Publication Year: 2010 , Page(s): 2006 - 2019
95 S. Kim and L. Larson, “A 44-GHz SiGe BiCMOS Phase-Shifting Sub-Harmonic Up-Converter for Phased-Array Transmitters,” IEEE Transactions on Microwave Theory and Techniques, Volume: 58 , Issue: 5 , Part: 1, 2010 , pp. 1089 – 1099
96 M. Farazian, B. Asuri and L. Larson, “A Dual-Band CMOS CDMA Transmitter Without External SAW Filtering,” IEEE Transactions on Microwave Theory and Techniques, Volume: 58 , Issue: 5 , Part: 2, 2010, pp. 1349 – 1358
97 H. Khatri, P. Gudem, L. Larson, “An Active Transmitter Leakage Suppression Technique for CMOS SAW-less CDMA Receivers,” IEEE Journal of Solid-State Circuits, Volume: 45 , Issue: 8, 2010 , Page(s): 1590 - 1601
98 Y. Hong; D. Kimball, P. Asbeck, J Yook; L. Larson, “Single-Ended and Differential Radial Power Combiners Implemented With a Compact Broadband Probe,” IEEE Transactions on Microwave Theory and Techniques, Volume: 58 , Issue: 6, 2010 , pp.1565 – 1572
99 S. Park, L. Larson, L. Milstein, “An RF Receiver Detection Technique for Cognitive Radio Coexistence, Circuits and Systems II: Express Briefs, IEEE Transactions on Volume: 57, Issue: 8, 2010 , Page(s): 652 - 656
100 A. Afsahi, A. Behzad, V. Magoon, L. Larson, “Linearized Dual-Band Power Amplifiers With Integrated Baluns in 65 nm CMOS for a 2 x 2 802.11n MIMO WLAN SoC,” IEEE Journal of Solid-State Circuits, Volume: 45 , Issue: 5, 2010 , pp. 955 – 966.
101 S. Park; Larson, L.E.; Milstein, L.B.; “Spectrum Broadening Due to Phase Noise Interaction in Cognitive Radio Systems, Communications Letters, Volume: 14 , Issue: 10, Publication Year: 2010 , Page(s): 891 - 89
102 H. Pan, L. Larson, “An Improved Broadband High Linearity SiGe HBT Differential Amplifier” IEEE Transactions on Circuits and Systems I: Regular Papers, vol.58, no.8, pp.1685-1694, Aug. 2011
103 N. Kim, V. Aparin and L. Larson, “Analysis of Asymmetry in MOSFET Small-Signal Amplifiers, IEEE Transactions on Circuits and Systems I: Regular Papers, vol.58, no.4, pp.668-676, April 2011
104 Kheirkhahi, A.; Naghshtabrizi, P.; Larson, L. E.; , "Stability Analysis of RF Power Amplifier Envelope Feedback," Circuits and Systems II: Express Briefs, IEEE Transactions on , vol.58, no.12, pp.852-856, Dec. 2011
105 Myoungbo Kwak; Kimball, D.F.; Presti, C.D.; Scuderi, A.; Santagati, C.; Yan, J.J.; Asbeck, P.M.; Larson, L.E.; , "Design of a Wideband High-Voltage High-Efficiency BiCMOS Envelope Amplifier for Micro-Base-Station RF Power Amplifiers," Microwave Theory and Techniques, IEEE Transactions on , vol.60, no.6, pp.1850-1861, June 2012
106 Huang, C.; Buisman, K.; Zampardi, P. J.; Larson, L. E.; de Vreede, L. C. N.; , "On the Compression and Blocking Distortion of Semiconductor-Based Varactors," Microwave Theory and Techniques, IEEE Transactions on , vol.60, no.12, pp.3699-3709, Dec. 2012
107 Nakatani, T.; Rode, J.; Kimball, D.F.; Larson, L.E.; Asbeck, P.M.; , "Digitally-Controlled Polar Transmitter Using a Watt-Class Current-Mode Class-D CMOS Power Amplifier and Guanella Reverse Balun for Handset Applications," Solid-State Circuits, IEEE Journal of , vol.47, no.5, pp.1104-1112, May 2012
108 Hassan, M.; Larson, L.E.; Leung, V.W.; Asbeck, P.M.; , "A Combined Series-Parallel Hybrid Envelope Amplifier for Envelope Tracking Mobile Terminal RF Power Amplifier Applications," Solid-State Circuits, IEEE Journal of , vol.47, no.5, pp.1185-1198, May 2012

109 Hassan, M.; Larson, L.E.; Leung, V.W.; Kimball, D.F.; Asbeck, P.M.; , "A Wideband CMOS/GaAs HBT Envelope Tracking Power Amplifier for 4G LTE Mobile Terminal Applications," Microwave Theory and Techniques, IEEE Transactions on , vol.60, no.5, pp.1321-1330, May 2012
110 Afsahi, A.; Larson, L.E., "Monolithic Power-Combining Techniques for Watt-Level 2.4-GHz CMOS Power Amplifiers for WLAN Applications," Microwave Theory and Techniques, IEEE Transactions on , vol.61, no.3, pp.1247,1260, March 2013
111 Abdelhalem, S.H.; Gudem, P.S.; Larson, L.E., "Hybrid Transformer-Based Tunable Differential Duplexer in a 90-nm CMOS Process," Microwave Theory and Techniques, IEEE Transactions on , vol.61, no.3, pp.1316,1326, March 2013
112 Agah, A.; Dabag, H.-T.; Hanafi, B.; Asbeck, P.M.; Buckwalter, J.F.; Larson, L.E., "Active Millimeter-Wave Phase-Shift Doherty Power Amplifier in 45-nm SOI CMOS," Solid-State Circuits, IEEE Journal of , vol.48, no.10, pp.2338,2350, Oct. 2013
113 Kheirkhahi, A.; Yan, J.J.; Asbeck, P.M.; Larson, L.E., "RF Power Amplifier Efficiency Enhancement by Envelope Injection and Termination for Mobile Terminal Applications," Microwave Theory and Techniques, IEEE Transactions on , vol.61, no.2, pp.878,889, Feb. 2013
114 Larson, L., "Thoughts on Gabor Temes," Solid-State Circuits Magazine, IEEE , vol.5, no.2, pp.16,17, June 2013
115 Abdelhalem, S.H.; Gudem, P.S.; Larson, L.E., "An RF–DC Converter with Wide-Dynamic-Range Input Matching for Power Recovery Applications," Circuits and Systems II: Express Briefs, IEEE Transactions on , vol.60, no.6, pp.336,340, June 2013.
116 Abdelhalem, S.H.; Gudem, P.S.; Larson, L.E., "Tunable CMOS Integrated Duplexer With Antenna Impedance Tracking and High Isolation in the Transmit and Receive Bands," Microwave Theory and Techniques, IEEE Transactions on , vol.62, no.9, pp.2092,2104, Sept. 2014.
117 Kheirkhahi, A.; Yan, J.J.; Asbeck, P.M.; Larson, L.E., "Improved Envelope Injection and Termination (EIT) RF Power Amplifier With Envelope Equalization for Mobile Terminal Applications," Microwave Theory and Techniques, IEEE Transactions on , vol.62, no.2, pp.341,351, Feb. 2014
118 Agah, A.; Jayamon, J.A.; Asbeck, P.M.; Larson, L.E.; Buckwalter, J.F., "Multi-Drive Stacked-FET Power Amplifiers at 90 GHz in 45 nm SOI CMOS," Solid-State Circuits, IEEE Journal of , vol.49, no.5, pp.1148,1157, May 2014
119 Thomas, C.M.; Larson, L.E., "A CMOS Broadband Distributed N-Path Tunable Bandpass Filter," Microwave and Wireless Components Letters, IEEE , vol.24, no.8, pp.542,544, Aug. 2014
120 Ming Yin, David A. Borton, Jacob Komar, Naubahar Agha, Yao Lu, Hao Li, Jean Laurens, Yiran Lang, Qin Li, Christopher Bull, Lawrence Larson, David Rosler, Erwan Bezard, Gregoire Courtine, and Arto V. Nurmikko, Wireless Neurosensor for Full-Spectrum Electrophysiology Recordings during Free Behavior, Neuron, (2014)
121 Larson, L., "RF and Microwave Hardware Challenges for Future Radio Spectrum Access," Proceedings of the IEEE , vol.102, no.3, pp.321,333, March 2014 (Invited Proceedings Paper).
122 Thomas, C.M.; Larson, L.E., "Broadband Synthetic Transmission-Line N-Path Filter Design," in Microwave Theory and Techniques, IEEE Transactions on , vol.63, no.10, pp.3525-3536, Oct. 2015
123 Bagheri, M.; Bagheri, R.; Buckwalter, J.F.; Larson, L.E., "Tuning-Range Enhancement Through Deterministic Mode Selection in RF Quadrature Oscillators," in Microwave Theory and Techniques, IEEE Transactions on , vol.63, no.11, pp.3713-3726, Nov. 2015.
124 C. Kim, S. Joshi, C. M. Thomas, S. Ha, L. E. Larson and G. Cauwenberghs, "A 1.3 mW 48 MHz 4 Channel MIMO Baseband Receiver With 65 dB Harmonic Rejection and 48.5 dB Spatial Signal Separation," in IEEE Journal of Solid-State Circuits, vol. 51, no. 4, pp. 832-844, April 2016.
125 M. Bagheri, R. Bagheri, J. F. Buckwalter and L. E. Larson, "Temperature Sensitivity of Non-Degenerate Modes in CMOS LC Quadrature Oscillators," in IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 65, no. 8, pp. 1004-1008, Aug. 2018.
126: A. R. Wichman and L. E. Larson, "A Background Spread-Spectrum Radio Frequency Nonlinear Parameter Measurement Technique," in IEEE Transactions on Signal Processing, vol. 66, no. 17, pp. 4516-4526, Sept.1, 2018.

127. J Jeong, F Laiwalla, J Lee, R Ritasalo, M Pudas, L Larson, V Leung, A. Nurmikko, "Conformal hermetic sealing of wireless microelectronic implantable chiplets by multilayered atomic layer deposition (ALD) Advanced Functional Materials 29 (5), 1806440, 62,2019.
128. J Lee, V Leung, AH Lee, J Huang, P Asbeck, PP Mercier, S Shellhammer, L. Larson, F. Laiwalla, "Wireless ensembles of sub-mm microimplants communicating as a network near 1 GHz in a neural application," bioRxiv, 2020.09. 11.293829, 13, 2020
129. J Lee, V Leung, AH Lee, J Huang, P Asbeck, PP Mercier, S Shellhammer and L.E. Larson, "Neural recording and stimulation using wireless networks of microimplants," in Nature Electronics vol. 4 (8), pp.604-614, 2021.

Books and Book Chapters

1 L. E. Larson, P. T. Greiling, and J. F. Jensen, "GaAs Device Physics and Circuit Design", in **Microprocessor Design for GaAs Technology**, V. Milutinovic, Ed., (Prentice Hall, York, 1989), Chapter 1, pp. 1-47. BOOK CHAPTER
2 L. E. Larson, "High-Speed Analog-to-Digital and Digital-to-Analog Conversion with GaAs Technology: Prospects, Trends, and Obstacles", in **GaAs Technology and Devices and Their Impact on Circuits and Systems**, D. Haigh, Ed., (Peter Peregrinus, Ltd, 1989). 22 pages. BOOK CHAPTER
3 L. E. Larson and G. C. Temes, "Signal Conditioning and Interface Circuits", in **McGraw-Hill Handbook of Digital Signal Processing**, S. Mitra, Ed., 1993. 44 pages. BOOK CHAPTER
4 L. E. Larson, "GaAs Operational Amplifier Design", in **High-Speed Analog Integrated Circuits**, R. Goyal, Ed., (Wiley Interscience, York, 1995), Chapter 7. 34 pages. BOOK CHAPTER
5 L. E. Larson, **RF and Microwave Circuit Design for Wireless Communications** (Artech House, Inc., 1996). 380 pages. EDITED BOOK
6 M. Matloubian and L. E. Larson, "InP-Based Power HEMTs", in **Pseudomorphic HEMT Technology and Applications**, Ed. R. L. Ross et al., (Kluwer Academic Publishers, Netherlands, 1996), pp. 275-299. BOOK CHAPTER
7 J. Groe, and L. E. Larson, **CDMA Mobile Radio Design: Systems, Algorithms, and Circuits** (Artech House, Inc., 2000). 346 pages. BOOK
8 L. Larson and F. Chang, "Si/SiGe HBT Technology for Low-Power Mobile Communications Systems Applications," in **RF Technologies for Low-Power Wireless Communications,** Ed. T. Itoh, G. Haddad, and J. Harvey, Wiley Interscience, 2001. 35 pages. BOOK CHAPTER
9 X. Zhang, L. Larson, and P. Asbeck, **Design of Linear Outphasing Power Amplifiers for Wireless Communications**, Artech House, 2002. 196 pages. BOOK
10 **Digital Communications Using Chaos and Nonlinear Dynamics,** Larson, Lawrence E; Liu, Jia-Ming; Tsimring, Lev S. (Eds.) 2006, XIV, 382 pages, 196 illus., Hardcover, Springer. EDITED BOOK
11 **Circuits and Systems for Future Generations of Wireless Communications**, A. Tasic, W. Serdijn, L. Larson, G. Setti, G. (Eds.), 2009, VIII, 308 pages, Hardcover, Springer. EDITED BOOK
12 **Fast Hopping Frequency Generation in Digital CMOS**, Mohammad Farazian, Lawrence E. Larson, Prasad S. Gudem. 165 pages, Hardcover, 2012 Springer. BOOK
13 **Next generation microscale wireless implant system for high-density, multi-areal, closed-loop brain computer interface**s F Laiwalla, VW Leung, J Lee, P Mercier, P Asbeck, R Rao, L Larson, Brain-Computer Interface Research: A State-of-the-Art Summary 9, 39-51, 2021, BOOK CHAPTER

Refereed Conference Proceedings (full peer committee review of submitted manuscript with feedback and full article published in conference proceedings along with accompanying presentation at conference)

1 L. E. Larson, J. F. Jensen, H. M. Levy, P. T. Greiling, and G. C. Temes, "GaAs Differential Amplifiers", Proc. IEEE GaAs IC Symposium, pp. 19-22 (November 1985).

2 L. E. Larson, J. F. Jensen, P. T. Greiling, and M. Waldner, "GaAs Technology for High-Speed Digital Computation", Proc. Intl. Conf. on Computer Design, pp. 713-716 (October 1985). INVITED RESEARCH ARTICLE

3 L. E. Larson, K. W. Martin, and G. C. Temes, "GaAs Switched-Capacitor Circuits for Video Signal Processing", Proc. 1987 Intl. Solid-State Circuits Digest., 30, pp. 40-41 (1987).

4 L. E. Larson and G. C. Temes, "Switched-Capacitor Building-Blocks With Reduced Sensitivity to Finite Amplifier Gain, Bandwidth and Offset Voltage", Proc. 1987 Intl. Symp. on Circuits and Systems, pp. 334-338 (1987).

5 L. E. Larson, "Gallium Arsenide MESFET Modeling for Analog Integrated Circuit Design", Proc. 1987 Intl. Symp. on Circuits and Systems, pp. 1-5 (1987).

6 L. E. Larson and G. C. Temes, "Filter Design Strategies for GaAs Switched-Capacitor Circuits", Proc. 1987 Intl. Symp. on Circuits and Systems, pp. 199-203 (1987).

7 L. Kunsage, L. E. Larson, K. W. Martin, and G. C. Temes, "Switched-Capacitor Circuits With Reduced Sensitivity to Finite Amplifier Gain, Bandwidth and Offset Voltage", Proc. ECCTD, pp. 351-355 (September 1987).

8 A. S. Brown, U. K. Mishra, L. E. Larson, and S. E. Rosenbaum, "The Elimination of dc I-V Anomalies in GaInAs-AlInAs HEMT Structures", Intl. Symp. on GaAs and Related Compounds, pp. 445-448 (1988).

9 G. C. Temes, L. E. Larson, and K. W. Martin, "State-of-the-Art and Future Prospects for Analog Signal Processing: A Tutorial", Proc. 1988 IEEE Intl. Symp. on Circuits and Systems, pp. 1655-1660 (1988). INVITED RESEARCH ARTICLE

10 L. E. Larson, "High-Speed Analog-to-Digital Conversion With GaAs Technology: Prospects, Trends, and Obstacles", Proc. 1988 IEEE Intl. Symp. on Circuits and Systems, pp. 2871-2878 (1988). INVITED RESEARCH ARTICLE

11 R. H. Walden, A. Schmitz, and L. E. Larson, "A 4-Bit Sub-Half Micrometer CMOS/SOS Flash Analog-to-Digital Converter Using Focused Ion Beam Implants", IEEE Custom Integrated Circuits Conf., pp. 18.7.1 - 18.7.4 (1988).

12 M. J. Delaney, A. S. Brown, U. K. Mishra, C. S. Chou, L. E. Larson, L. D. Nguyen, and J. F. Jensen, "Low-Temperature MBE Growth of GaAs and AlInAs for High-Speed Devices", Proc. IEEE/Cornell Conference on Advanced Concepts in High-Speed Semiconductor Devices and Circuits, pp. 64-72 (August 1989).

13 L. E. Larson, C. S. Chou, D. S. Deakin, W. W. Hooper, J. F. Jensen, M. A. Thompson, M. J. Delaney, L. G. McCray, S. E. Rosenbaum, and D. A. Pierson, "A 10 GHz MESFET Operational Amplifier in GaAs MESFET Technology", Proc. 1989 IEEE Intl. Solid State Circuits Digest, 32, pp. 72-73 (1989).

14 L. Nguyen, A. Brown, M. Delaney, U. Mishra, L. Larson, L. Jelloian, M. Melendes, C. Hooper, and M. Thompson, "Vertical Scaling of Ultra-High-Speed AlInAs-GaInAs HEMTs", Proc. 1989 Intl. Electron Devices Meeting, pp. 105-108 (1989).

15 T. Cataltepe, A. R. Kramer, L. E. Larson, G. C. Temes, and R. H. Walden, "Digitally Corrected Multi-Bit $\sum$-Δ Data Converters", Proc. 1989 Intl. Symp. on Circuits and Systems, pp. 647-650 (1989).

16 A. S. Brown, C. S. Chou, M. J. Delaney, C. E. Hooper, J. F. Jensen, L. E. Larson, U. Mishra, L. D. Nguyen, and M. S. Thompson, "Low-Temperature Buffer AlInAs/GaInAs on InP HEMT Technology for Ultra-High-Speed Integrated Circuits", Proc. 1989 IEEE GaAs IC Symp. Digest, pp. 143-146 (1989).

17 M. J. Delaney, C. S. Chou, L. E. Larson, J. F. Jensen, D. S. Deakin, A. S. Brown, W. W. Hooper, M. A. Thompson, L. G. McCray, and S. E. Rosenbaum, "GaAs MESFET Digital Integrated Circuits Fabricated With Low Temperature Buffer Technology", IEEE 1989 Custom Integrated Circuits Conference, pp. 18.3.1-18.3.4 (1989)

18 J. A. Bishop, M. M. Hashemi, K. Kiziloglu, L. E. Larson, N. Dagli, and U. K. Mishra, "Monolithic Coaxial Transmission Lines for mm-Wave ICs", 1991 Cornell Conference on High-Speed Semiconductor Devices , (August 1991). pp.252-60 .
19 C . S. Chou, K. Litvin, L. E. Larson, S. E. Rosenbaum, L. D. Nguyen, U. K. Mishra, M. Lui, M. Thompson, C. Ngo, and M. Melendes, "Coplanar Waveguide InP-Based HEMT MMICs for Microwave and Millimeter Wave Applications", 1991 SPIE Conference, (June 1991). pp.151-156.
20 G. M. Atkinson, R. L. Kubena, L. E. Larson, L. D. Nguyen, F. P. Stratton, L. M. Jelloian, M. V. Le, and H. McNulty, "Self-Aligned HEMT Gate Fabrication Using Focused Ion Beams", Intl. Electron, Ion, and Photon Beams Symp., (June 1991). 4 pages.
21 M. A Thompson, L. M. Jelloian, L. D. Nguyen, A. S. Brown, and L. E. Larson, "50 nm Long "Y" Shaped Gate Structures Incorporated into a Super Self-Aligned HEMT Process for Terahertz Operation", Intl. Electron, Ion, Photon Beams Symp., (June 1991). 4 pages
22 L. M. Jelloian, L. E. Larson, S. E. Rosenbaum, A. E. Schmitz, M. A. Thompson, M. Lui, L. D. Nguyen, and U. Mishra, "Manufacturing Study of Yield and Performance Dependence on Gate Length for Nanometer Scale AlInAs/GaInAs HEMTs", Proc. 1991 Mantech Symp., pp. 5-8 (1991).
23 L. D. Nguyen, A. S. Brown, and L. E. Larson, "Sub-Millimeter Wave InP-Based High Electron Mobility Transistors", Proc. 2nd Intl. Symp. on Space THz Technology, pp. 302-306 (February 1991).
24 S. E. Rosenbaum, K. Litvin, C. S. Chou, L. E. Larson, L. D. Nguyen, C. Ngo, M. Lui, J. Henige, M. A. Thompson, U. K. Mishra, and D. Pierson, "AlInAs/GaInAs on InP HEMT Low Noise MMIC Amplifiers", IEEE MIT-S Digest., pp. 815-818 (1991).
25 M. Matloubian, L. D. Nguyen, A. S. Brown, L. E. Larson, M. A. Melendes, and M. A. Thompson, "High Power and High Efficiency AlInAs/GaInAs on InP HEMTs", 1991 IEEE MTT-S Digest., pp. 721-724 (1991).
26 R. H. Walden, W. W. Hooper, C. S. Chou, C. Ngo, R. WongQuen, R. A. Metzger, F. Williams, L. E. Larson, and R. Blumgold, "Multigigahertz Monolithic GaAs Optoelectronic Receivers Using 0.2 µm Gate-Length MESFETs", 1991 IEEE MIT-S Digest., pp. 491-494 (1991).
27 L. E. Larson, R. H. Hackett, M. A. Melendes, and R. F. Lohr, "Micromachined Microwave Actuator Technology - A Tuning Approach for Microwave Integrated Circuits", Proc. 1991 Microwave and Millimeter Wave Monolithic Circuits Symp., pp. 27-30 (1991).
28 L. E. Larson, R. H. Hackett, and R. F. Lohr, "Microactuators for GaAs-Based Microwave Integrated Circuits", Proc. 1991 Transducers Conference, pp. 743-746 (1991).
29 R. H. Hackett, L. E. Larson, and M. A. Melendes, "The Integration of Micro-Machine Fabrication With Electronic Device Fabrication on III-V Semiconductor Materials", Proc. 1991 Transducers Conference, pp. 51-54 (June 1991).
30 W. E. Stanchina, R. A. Metzger, D. B. Rensch, L. M. Burns, J. F. Jensen, R. H. Walden, L. E. Larson, and P. T. Greiling, “InP Based Technology for Monolithic Multiple-Device, Multiple-Function ICs”, Proc. GOMAC-91 Digest of Papers, (1991). 4 pages.
31 R. Hackett and L. Larson, "Alternative Materials for Micro-Electro-Mechanical Device Construction", Proc. MRS, pp. 241-252 (June 1992).
32 L. E. Larson and J. J. Brown, "InP Integrated Circuit Technology for Microwave, Digital, and Optoelectronic Applications", IEEE 14th GaAs IC Symp. Technical Digest, pp. 247-250 (October 1992). INVITED RESEARCH ARTICLE
33 M. Matloubian, L. Larson, A. Brown, L. Jelloian, L. Nguyen, M. Lui, T. Liu, J. Brown, M. Thompson, W. Lam, A. Kurdoghlian, R. Rhodes, M. Delaney, and J. Pence, "InP-Based HEMTs for the Realization of Ultra-High Efficiency Millimeterwave Power Amplifiers", Proc. 1993 IEEE Cornell Conference on Advanced Concepts in High-Speed Semiconductor Devices and Circuits, pp. 520-527 (1993).
34 A. Brown, J. Brown, J. Henige, R. Wilson, R. Metzger, M. Melendes, M. Matloubian, L. Jelloian, and L. Larson, "The Growth of High Performance GaInAs-AlInAs Power HEMT Devices by MBE: Si Segregation and Activation and Strained Layer Structural Quality", Proc. of 1993 EMC Meeting, (1993). 4 pages.

35 M. Matloubian, L. M. Jelloian, A. S. Brown, L. D. Nguyen, L. E. Larson, M. J. Delaney, M. A. Thompson, R. A. Rhodes, and J. E. Pence, "V-Band High-Efficiency High-Power AlInAs/GaInAs/InP HEMTs", 1993 IEEE MTT-S Digest., 2, pp. 535-538 (1993).
36 S. E. Rosenbaum, C. S. Chou, C. M. Ngo, L. E. Larson, T. Liu, and M. A. Thompson, "A 7 to 11 GHz AlInAs/GaInAs/InP MMIC Low-Noise Amplifier", 1993 IEEE MTT-S Digest, 2, pp. 1103-1104 (1993).
37 A. Kurdoghlian, W. Lam, C. Chou, L. Jelloian, A. Igawa, M. Matloubian, L. Larson, A. Brown, M. Thompson, and C. Ngo, "High-Efficiency InP-Based HEMT MMIC Power Amplifier", Proc. 1993 15th IEEE GaAs IC Symp. Digest, pp. 375-377 (1993).
38 S. E. Rosenbaum, L. M. Jelloian, A. S. Brown, M. A. Thompson, M. Matloubian, L. E. Larson, R. F. Lohr, B. K. Kormanyos, G. M. Rebeiz, and L. P. B. Katehi, "A 213 GHz AlInAs/GaInAs/InP HEMT MMIC Oscillator", Proc. 1993 Intl. Electron Devices Technical Digest, pp. 924-926 (1993).
39 M. Matloubian, L. M. Jelloian, M. Lui, T. Liu, L. E. Larson, M. V. Le, D. M. Jang, and R. A. Rhodes, “GaInAs/InP Composite Channel HEMTs for Millimeter Wave Power Applications”, International Conference on Millimeter and Submillimeterwaves and Applications, (1994). 4 pages.
40 M. Case, S. Rosenbaum, C. Ngo, M. Matloubian, A. Brown, J. Henige, M. Thompson, and L. Larson, “High Efficiency, High Gain K- and Ku-Band InP-Based HEMT MMIC Amplifiers for Array Applications”, 1994 IEEE MTT-S European Topical Congress, pp. 49-54 (1994).
41 J. Pusl, M. Rodwell, M. Case, L. Nguyen, M. Thompson, and L. Larson, "Ultra-Wideband Monolithic HEMT Distributed Amplifiers", 1995 IEEE MTT Symp., (1995). pp. 1661-1664.
42 J. J. Brown, M. Matloubian, T. K. Liu, L. M. Jelloian, A. E. Schmitz, R. G. Wilson, M. Lui, L. E. Larson, M. A. Melendes, and M. A. Thompson, “InP-Based HEMTs with AlIn1-xP Schottky Barrier Layers Grown by Gas-Source MBE”, Proc. 6th International Indium Phosphide and Related Materials Conference, pp. 419-422 (1994).
43 A. S. Brown, A. E. Schmitz, L. D. Nguyen, J. A. Henige, et al., “The Growth of High Performance InxGa1-xAs (0.52 < x < 0.9)-(Al0.48In0.52As) High Electron Mobility Transistors by MBE”, Proc. 6th International Conference on Indium Phosphide and Related Materials, pp. 263-266 (1994).
44 M. Case, S. Knorr, L. Larson, D. Rensich, D. Harame, B. Meyerson, and S. Rosenbaum “A 23 GHz Static 1/128 Frequency Divider Implemented in a Manufacturable Si/SiGe HBT Process”. Proc. 1995 Bipolar/BiCMOS Circuits and Technology Meeting, pp. 121-124 (1995).
45 M. Case, P. MacDonald, M. Matloubian, M. Chen, L. Larson, and D. Rensch, “High Performance Microwave Elements for SiGe MMICs”, Proc. IEEE/Cornell Conference on Advanced Concepts in High Speed Semiconductor Devices and Circuits, pp. 85-92 (1995).
46 D. Harame, L. Larson, M. Case, S. Kovacic, S. Voinigescu, T. Tewksbury, D. Nguyen-Ngoc, K. Stein, J. Cressler, S-J. Jeng, J. Malinowski, R. Groves, E. Eld, D. Sunderland, D. Renach, M. Gilbert, K. Schonenberg, D. Ahlgren, S. Rosenbaum, J. Glenn, and B. Meyerson, “SiGe HBT Technology: Device and Application Issues”, International Electron Devices Meeting Technical Digest, pp. 731-734 (1995).
47 J. Pusl, B. Agarwal, R. Pullela, L. D. Nguyen, M. V. Le, M. J. W. Rodwell, L. Larson, J. F. Jensen, R. Y. Yu, and M. G. Case, “Capacitive-Division Traveling-Wave Amplifier With 340 GHz Gain/Bandwidth Product”, Proc. 1995 Microwave and Millimeter-Wave Monolithic Circuits Symp. Digest, 3, 1661 (1995). pp. 175-178.
48 L. Larson, M. Case, S. Rosenbaum, D. Rensch, P. MacDonald, M. Matloubian, M. Chen, D. Harame, J. Malinowski, B. Meyerson, M. Gilbert, and S. Maas, “Si/SiGe HBT Technology for Low-Cost Monolithic Microwave Integrated Circuits”, 1996 IEEE International Solid-State Circuits Digest, pp. 80-82 (1996).
49 M. Case, S. A. Maas, L. Larson, D. Rensch, D. Harame, and B. Meyerson, “An X-Band Monolithic Active Mixer in SiGe HBT Technology”, 1996 IEEE MTT-S International Microwave Symp. Digest, 2, pp. 655-658 (1996).
50 L. E. Larson, “Silicon Bipolar Transistor Design and Modeling for Microwave Integrated Circuit Applications”, Invited Paper, Proc. 1996 IEEE Bipolar/BiCMOS Circuits and Technology Meeting, pp. 142-148 (1996). INVITED RESEARCH ARTICLE
51 L. Larson, “Integrated Circuit Technology Options for RFIC’s - Present Status and Future Directions”, Proc. Custom Integrated Circuits Conference, Vol. 1, pp. 169-176 (1997). INVITED RESEARCH ARTICLE

52 C. Baringer, L. Larson, and J. Shealy, “A Silicon Bipolar Broadband PLL Building Block Integrated Circuit”, Proc. 1997 IEEE Bipolar Circuits and Technology Meeting, (September 1997). pp. 80-83.

53 S. Rosenbaum, C. Baringer, and L. Larson, “Design of a High Dyanmic Range Variable Gain Amplifier for a DBS Turner Front-End”, Proc. First Annual IEEE UCSD Center for Wireless Communications Conference, pp. 83-89, (March 1998).

54 D. Laney, L. Larson, J. Malinowski, D. Harame, S. Subbanna, R. Volant, M. Case, and P. Chan, “Low-Loss Microwave Transmission Lines and Inductors Implemented in a Si/SiGe HBT Process”, 1998 IEEE Bipolar Circuits and Technology Meeting, (1998). pp. 101-104.

55 L. Larson, “Low-Power Radio Frequency Circuit Architectures for Portable Wireless Communications”, Proc. IEEE International Symposium on Circuits and Systems, pp. 1518-1522, (June 1998).

56 J. Pulver, D. Rowe, and L. Larson, “A 16x16 Si/SiGe HBT Cross-Point Switch Architecture for High-Speed Switching Applications”, IEEE Hot Interconnects Symposium, pp. 52-56, (August 1998).

57 P. Asbeck, G. Hanington, P. Chen, and L. Larson, “Efficiency and Linearity Improvements in Power Amplifiers for Wireless Communications,” Proceedings of 1998 IEEE GaAs IC Symposium pp. 15-18, (October 1998). INVITED RESEARCH ARTICLE

58 L. Larson, “Si/SiGe and III-V Integrated Circuit Technology for Next Generation High-Speed Systems: Comparisons & Tradeoffs,” Proc. 1998 MRS Meeting, pp. 433-435, (Dec. 1998).

59 W.T. Thornton and L. Larson, “Improved Design Techniques for the Realization of Linear Power Amplifiers for Wireless Transmitters,” Proc. 1999 Southwest Symposium on Mixed-Signal Design, pp. 151-155, April 11-13, (1999).

60 L. Sheng and L. Larson, “Nonlinearity Analysis of a Homodyne Receiver in a Multichannel Wireless Communications System” Proc. Second Annual IEEE UCSD Center for Wireless Communications Conference, pp. 33-39, (March 1999).

61 D. Rowe, B. Pollack, J. Pulver, W. Chon, P. Jett, L. Fullerton, and L. Larson, “A Si/SiGe HBT Timing Generator IC for High-Bandwidth Impulse Radio Applications,” IEEE 1999 Custom Integrated Circuits Conference, pp. 221-224 (1999).

62 S. Vora and L. Larson, "Noise Power Optimization of Monolithic CMOS VCOS," 1999 Radio Frequency Integrated Circuit Symp. Digest, 2, pp. 163-166 (1999).

63 W. Xiong and L. Larson, "An S-band Low-Noise Amplifier with Self-Adjusting Bias for Improved Power Consumption and Dynamic Range in a Mobile Environment,” 1999 IEEE MTT-S International Microwave Symp. Digest, pp. 497-500, (1999).

64 D.C. Laney, L. Larson, P. Chan, J. Malinowski, D. Harame, Seshadri Subbanna, R. Volant, and M. Case, “Lateral Microwave Transformers and Inductors Implemented in a Si/SiGe HBT Process,” 1999 IEEE MTT-S International Microwave Symp. Digest, pp. 855-858, (1999).

65 L. Larson, "Microwave MEMs Technology for Next-Generation Wireless Communications,” 1999 IEEE MTT-S International Microwave Symp. Digest, pp. 1073-1076 (1999). INVITED RESEARCH ARTICLE

66 L. Larson and M. J. Delaney, "Applications of Si/SiGe Technology for High-Speed Communications Systems,” 1999 IEEE MTT-S International Microwave Symp. Digest, pp. 1077-1080 (1999). INVITED RESEARCH ARTICLE

67 L. Larson, P. Asbeck, and Wei Xiong, “Energy Constrained RF Transceivers for Mobile Wireless Communications,” Proc. 1999 IEEE Wireless Communications and Networking Conference, vol. 1, pp. 197-200, Sept 21-24, 1999.

68 L. Sheng, J. Jensen, and L. Larson, "A Si/SiGe HBT Harmonic Mixer/Downconverter," Proc. 1999 Bipolar/BiCMOS Circuits and Technology Meeting, pp. 71-74, Sept. 26-28, 1999.

69 L. Larson, P. Asbeck, and W. Xiong “Adaptive Hardware Techniques for Improved Power Management of Radio Receivers,” Proc. 1999 International Symposium on Advanced Radio Technologies, Sept. 8-10, 1999. 4 pages.

70 G.M Maggio, N. Rulkov, M. Sushchik, L. Tsimring, A. Volkovskii, H. Abarbanel, L. Larson, and K. Yao, “Chaotic Pulse-Position Modulation for Ultrawide-Band Communication Systems,” Proc. 1999 International Ultra Wideband Conference, Washington, DC, Sept. 28-30, 1999. 4 pages.

71 M. Sushchik, N. Rulkov, L. Tsimring, A. Volkovskii, H. Abarbanel, L. Larson, K Yao, “Chaotic Pulse Trains in Digital Communications,” Proc. of the 5th Experimental Chaos Conference, Orlando, FL, June 28 – July 1, 1999. pp. 101-111.

72 L. Larson, and L. DeVreede, “The Impact of Silicon Technology on Future Microwave Systems” Proc. 1999 European Microwave Conference, Munich, Germany, pp. 752-756, October 1999. INVITED RESEARCH ARTICLE

73 G. Niu, S. Zhang, J. Cressler, A. Joseph, J. Fairbanks, L. Larson, C. Webster, W. Ansley, and D. Harame, “SiGe Profile Design Tradeoffs for RF Circuit Applications” 1999 International Electron Devices Meeting Technical Digest, pp. 573-576, Dec. 1999.

74 G. Niu, S. Zhang, J.D. Cressler, A. Joseph, J. Fairbanks, L. Larson, C. Webster, W.E. Ansley, D.L. Harame, "Noise parameter modeling and SiGe profile design tradeoffs for RF applications." 2000 Topical Meeting on Silicon Monolithic Integrated Circuits and RF Systems. Digest of Papers, Garmischm Germany, pp. 9-14, April 26-28, 2000.

75 P. Asbeck and L. Larson, "Synergistic design of DSP and power amplifiers for wireless communications," 2000 Asia-Pacific Microwave Conference, Sydney, Australia, pp. 899-903, Dec. 3-6, 2000. INVITED RESEARCH ARTICLE

76 Larson, L., "Device and technology requirements for next generation communications systems,", 2000 International Electron Devices Meeting San Francisco, CA, pp. 737-740, Dec. 10-13, 2000. INVITED RESEARCH ARTICLE

77 L. Larson & P. Gudem, "Design of fully monolithic voltage controlled oscillators for wireless communications," Proceedings of MWE 2000, Yokohama, Japan, pp. 287-293.

78 R. Volant, R. Groves, S. Subbanna, E. Begle, D. Laney, L. Larson, "Fabrication of high frequency passives on BiCMOS silicon substrates," 2000 RF Integrated Circuit Symposium, Anaheim, CA, pp. 209-212, June 13-19, 2000

79 D. Jessie and L. Larson, "Improved techniques for the measurement and modeling of plastic surface mount packages to 20 GHz, Proceedings RAWCON 2000, 2000 IEEE Radio and Wireless Conference, pp. 243-246.

80 K.H. Kuo, M.S. Jung, J.S. Park, and Larson, L., "ACPR comparison of low pass and band pass type power amplifier for 22 Mbps wireless LAN application," RAWCON 2000, 2000 IEEE Radio and Wireless Conference, pp. 231-234, Sept. 2000.

81 J.C. Jensen and L. Larson, "A broadband 10 GHz track-and-hold in Si/SiGe HBT technology," 2000 IEEE Custom Integrated Circuits Conference, Orlando, FL., pp. 245-248, May 21-24, 2000.

82 K. Gard, L. Larson, and M. Steer, "Autocorrelation analysis of distortion generated from bandpass nonlinear circuits, Proceedings of 2001 Custom Integrated Circuits Conference (CICC), pp. 345-348.

83 D. Greenberg, D. Ahlgren, G. Freeman, S. Subbana, V. Radisc, D. Harvey, C. Webster, and L. Larson, "HBT low-noise performance in a 0.18 um SiGe BICMOS Technology, Proceedings of the 2000 IEEE MTT-S Conference, vol. 1, no. 3, pp. 9-12.

84 X. Zhang P. Nanawa, L. Larson, and P. Asbeck, "A gain/phase imbalance minimization technique for LINC transmitter," Proceedings of the IMS 2001, pp. 803-805, May 2001.

85 S. Subbana, L. Larson, G. Freeman, D. Ahlgren, K. Stein, C. Dickey, J. Mecke, A. Rincon, P. Bacon, R. Groves, M. Soyuer, D. Harame, J. Dunn, D. Rowe, W. Chon, D. Herman, and B. Meyerson, "Silicon-Germanium BICMOS Technology and a CAD environment for 2-40 GHz VLSI Mixed Signal ICS," Proceedings of the 2001 Custom Integrated Circuits Conference (CICC), pp. 559-566. INVITED RESEARCH ARTICLE

86 Wild, N.C.; Coakley, P.G.; Doft, F.; Thornton, T.; Larson, L.; Asbeck, P.M.; Iguartua, F. “Low-cost miniature unattended RF sensor suite,” Proceedings of the SPIE - The International Society for Optical Engineering, vol.4232, (Enabling Technologies for Law Enforcement and Security, Boston, MA, USA, 5-8 Nov. 2000. pp.391-8.

87 K. Gard, L. Larson, and M. Steer, "Generalized autocorrelation analysis of spectral regrowth from bandpass nonlinear circuits," 2001 IEEE MTT-S International Microwave Symposium Digest, Phoenix, AZ, IEEE 2001, pp. 9-12, vol. 1, May 2001

88 C. Wang; L. Larson, P. Asbeck, “A nonlinear capacitance cancellation technique and its application to a CMOS class AB power amplifier,” 2001 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium pp. 20-22, May 2001.
89 M. Iwamoto, A. Williams, P. Chen, A. Metzger, C. Wang, L. Larson, P. Asbeck, "An extended Doherty amplifier with high efficiency over a wide power range," 2001 IEEE MTT-S International Microwave Symposium Digest, pp. 540-543, Phoenix, AZ.
90 N.F. Rulkov, M.M. Sushchik, L.S. Tsimrng, A.R. Volkovskii, H.D.I. Abarbanel, L. Larson, K. Yao, "Digital communication using chaotic pulse generators," Proceedings of the 7th International Conference on Advances in Communications and Control (COMCON7), Athens, Greece, June 28 - July 2, 1999, Telecommunications/Signal Processing, pp. 715-724, 2000.
91 P. Asbeck, I. Galton, L. Larson, X Zhang, M. Iwamoto, J. Hinrichs, and J. Keyzer, "Digital control of power amplifiers for wireless communications," Proceedings of the EuMC 2001 Conference. pp. 71-74. INVITED RESEARCH ARTICLE
92 D.Y.C. Lie, J. Kennedy, D. Livezey, B. Yang, T. Robinson, N. Sornin, T. Beukema, L.E. Larson, A. Senior, C. Saint, J. Blonski, N. Swanberg, P. Pawlowski, D. Gonya, X. Yuan, and H. Zamat, “A Direct-Conversion W-CDMA Front-End SiGe Receiver Chip,” 2002 IEEE MTT-S International Microwave Symposium Digest, pp. 540-543, Seattle, WA.
93 C. Wang, L.E. Larson and P.M. Asbeck, “Improved Design Technique of a Microwave Class-E Power Amplifier with Finite Switching-on Resistance,” Proceedings of 2002 Radio and Wireless Conference (RAWCON), Aug. 2002. pp. 241-4.
94 D. Jessie, L. Larson, “Design techniques for improved microwave performance of small outline packages,” 2002 IEEE MTT-S International Microwave Symposium, Seattle, WA, USA, 2-7 June 2002. pp. 297-300.
95 P. Asbeck, H. Kobayashi, M. Iwamoto, G. Hanington, S. Nam, and L. Larson, “Augmented behavioral characterization for modeling the nonlinear response of power amplifiers,” 2002 IEEE MTT-S International Microwave Symposium Digest, Seattle, WA. pp. 135-138.
96 D. Jessie and L. Larson, “An improved characterization method for the dielectric properties of RFIC encapsulating plastics,” Proceedings of 2002 Radio and Wireless Conference (RAWCON), Aug. 2002. pp. 197-200.
97 D.C. Laney, G.M. Maggio, F. Lehmann, L.E. Larson, ``BER for multi-access UWB radio using pseudo-chaotic time hopping,’’ IEEE Radio and Wireless Conference (RAWCON), August 11-14, 2002, pp. 91-94
98 G.M. Maggio, D.C. Laney, F. Lehmann, L.E. Larson, ``A multi-access scheme for UWB radio using pseudo-chaotic time hopping,’’ Ultra Wideband Systems and Technologies Conference (UWBST), May 2002, pp. 225-229.
99 G. Maggio, D. Laney, and L. Larson, “BER and error-floor calculation for multi-access PCTH,”Global Telecommunications Conference, 2002. GLOBECOM '02. Volume 2, 2002 Pp.:1324 – 1328.
100 J. Jensen and L. Larson, “A 16 GHz Ultra High-Speed Si/SiGe Comparator,” in Proceedings IEEE Bipolar Circuits and Technology Meeting, 2002, pp.120-123
101 D.Y.C. Lie, X. Yuan, L.E. Larson, M. Case, T. Robinson, A. Senior, X. Wang, and J. Mecke, “Phase Noise Analysis of Fully-Integrated Digitally-Tuned Wideband Si/SiGe BiCMOS VCOs,” in Proceedings IEEE Bipolar Circuits and Technology Meeting 2002. pp. 65-68.
102 D. Malhi, H. Joba, C. Demirdag, Y. Takahashi, D. Wang, L. Larson, S. Shinjo, W. Gao, N. Suematsu, J. Glasser, P. Chominski, V. Pereira, L. Prestia, K. Schelkle, P. Bacon, K. Itoh and J. Comfort, “SiGe W-CDMA Transmitter For Mobile Terminal Application” in Proceedings IEEE Bipolar Circuits and Technology Meeting 2002. pp. 177-180.
103 P. Chominski, D. Malhi, L. Larson, J. Park, P. Gudem, R. Kloczkowski, C. Demirdag, A. Garlapati, and V. Pereira, “A Highly Integrated Si/SiGe BiCMOS Upconverter RFIC For 3G WCDMA,” in Proc. IEEE European Solid-State Circuits Conference, Sept. 2002. pp. 447-50.
104 P. Asbeck, H. Kobayashi, M. Iwamoto, G. Hanington, S. Nam, and L. Larson, “Augmented behavioral characterization for modeling the nonlinear response of power amplifiers. 2002 IEEE MTT-S International Microwave Symposium Digest, vol.1, 2002, pp.135-8 vol.1.
105 D. Lie, J. Kennedy, D. Livezey, B. Yang, T. Robinson, N. Sornin, T. Beukema, L. Larson, A. Senior, C. Saint, J. Blonski, N. Swanberg, P. Pawlowski, D. Gonya, X. Yuan, H. Zamat “A direct-conversion W-

CDMA front-end SiGe receiver chip," 2002 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium. Digest of Papers. IEEE. 2002, pp.31-4.

106 R. Tenny, L. Tsimring, H. Abarbanel, L. Larson, "Using chaotic bidirectional transmission for asymmetric private/public key encryption," AIP. American Institute of Physics Conference Proceedings, no.676, 2003, pp.373-4.

107 D. Laney, G. Maggio, F. Lehman, and L. Larson, "BER performance and spectral properties of interleaved convolutional time hopping for UWB impulse radio, Global Telecommunications Conference, 2003. GLOBECOM '03. IEEE, Volume 4, 1-5 Dec. 2003 Pp.:1994 - 1998 vol.4

108 R. Tenny, L. Tsimring, H. Abarbanel, L. Larson, "Asymmetric Key Encryption using Distributed Chaotic Nonlinear Dynamics.'" Proceedings of the IASTED International Conference on Communications Internet and Information Technology, St. Thomas, US Virgin Islands, pp.338-345, November 2002.

109 X. Yuan, D. Lie, L. Larson, J. Blonski, J. Gross J, M. Kumar, J. Mecke, A. Senior, Y. Chen, A. Poh, D. Harame, "RF linearity study of SiGe HBTs for low power RFIC design. Part I." 2002 3rd International Conference on Microwave and Millimeter Wave Technology, IEEE. 2002, pp.70-3.

110 X. Yuan, D. Lie, L. Larson, J. Blonski, J. Gross J, M. Kumar, J. Mecke, A. Senior, Y. Chen, A. Poh, D. Harame. "RF linearity study of SiGe HBTs for low power RFIC design. Part II, Analysis." 2002 3rd International Conference on Microwave and Millimeter Wave Technology, IEEE. 2002, pp.74-7.

111 D. Lie, X. Yuan, L. Larson, Y. Wang, A. Senior, J. Mecke, "RF-SoC: low-power single-chip radio design using Si/SiGe BiCMOS technology," 2002 3rd International Conference on Microwave and Millimeter Wave Technology IEEE. 2002, pp.30-7.

112 J. Fairbanks and L. Larson, "Analysis of optimized input and output harmonic termination on the linearity of 5 GHz CMOS radio frequency amplifiers," Proceedings RAWCON 2003 IEEE Radio and Wireless Conference, pp.293-296.

113 L. Larson, "Advances in Silicon Semiconductor Device Technology for Radio and Wireless Applications," Proceedings RAWCON 2003. IEEE Radio and Wireless Conference, pp.353-356 INVITED RESEARCH ARTICLE

114 L. Larson and D. Jessie, "Advances in RF Packaging Technologies for Next-Generation Wireless Communications Applications (Invited Paper)" 2003 IEEE Custom Integrated Circuits Conference. pp. 323-330 INVITED RESEARCH ARTICLE. BEST INVITED PAPER AWARD

115 V. Aparin and L. Larson, "Linearization of Monolithic LNAs using low-frequency low-impedance input termination," Proceedings of IEEE ESSCIRC 2003, pp. 137-140.

116 K. Gard, L. Larson, and M. Steer, "AM-AM and AM-PM Measurement of Baseband to RF Integrated Circuits for ACPR Calculations," Proceedings of Radio and Wireless Conference, RAWCON 2003 Pp.:273 - 276

117 V. Leung, L. Larson, and P. Gudem, "An improved digital-IF transmitter architecture for highly-integrated W-CDMA mobile terminals," IEEE Vehicular Technology Conference, 2003. VTC 2003-Spring. Pp.:1335 - 1339 vol.2

118 J. Fairbanks and L. Larson, "Analysis of termination impedance effects on the linearity of 5 GHz CMOS radio frequency amplifiers," 2003 Topical Meeting on Silicon Monolithic Integrated Circuits and RF Systems. Digest of Papers, Munich Germany, pp. 196-199

119 L. Larson, "The impact of emerging "4G" systems on the performance and complexity requirements of RFICs," 2003 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium. Digest of Papers IEEE. 2003, pp.15-18. INVITED RESEARCH ARTICLE

120 L. Larson, D. Laney and J. Jamp, "An Overview of Hardware Requirements for UWB Systems: Interference Issues and Transceiver Design Implications," MILCOM 2003. IEEE, 13-16 Pp.:863 - 867 Vol.2

121 T. Johansen and L. Larson, "Optimization of SiGe HBT VCOs for wireless applications. 2003 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium. Digest of Papers IEEE. 2003, pp.273-6.

122 L. Sheng and L. Larson, "A Si/SiGe BiCMOS mixer with 3rd-order nonlinearity cancellation for WCDMA applications," 2003 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium. Digest of Papers, IEEE. 2003, pp.417-20.

123 L. Sheng, and L. Larson, “A general theory of third-order intermodulation distortion in common-emitter RF circuits,” Proc. 2003 IEEE International Symposium on Circuits and Systems, pp. I-177-I-180.

124 Y. Zhao, M. Iwamoto, L. Larson, P. Asbeck, “Doherty amplifier with DSP control to improve performance in CDMA operation,” 2003 IEEE MTT-S International Microwave Symposium Digest, IEEE. Part vol.2, 2003, pp.687-90 vol.2.

125 W. Ni, X. Yuan, R. Groves, L. Larson, “Design and Modeling of a High-Q On-Chip Hairpin Inductor for RFIC Applications,” 2003 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium. Digest of Papers, IEEE. 2003, pp. 547-550.

126 L. Larson, “Si/SiGe HBT Technology as an Enabler for Advanced Communications Systems” Proceedings of 3rd International Conference on SiGe,” Santa Fe, NM, March, 2003, 3 pages, INVITED RESEARCH ARTICLE

127 L. Larson, “Millimeter-Wave Applications of SiGe Devices,” Proceedings of The International Joint Conference of the 6th Topical Symposium on Millimeter Waves (TSMMW2004) and the 5th MINT Millimeter-Wave International Symposium (MINT-MIS2004), Yokohama, Japan, Feb., 2004., 4 pages, INVITED RESEARCH ARTICLE

128 V. Leung, L. Larson, P. Gudem, “Digital-IF WCDMA Handset Transmitter IC in 0.25μm SiGe BiCMOS,” IEEE International Solid-State Circuits Conference, 2004, pp. 182-183.

129 J. Deng, P. Gudem, and L. Larson, “Linearity Analysis of SiGe HBT Amplifiers Using a Power-Dependent Coefficient Volterra Technique,” Proceedings of 2004 IEEE Radio and Wireless Conference (RAWCON), pp. 479-482.

130 V. Aparin and L. Larson, “Modified Derivative Superposition Method for Linearizing FET Low-noise Amplifiers,” Proceedings of 2004 IEEE RFIC Conference, pp. 105-108, 1st PLACE BEST STUDENT PAPER AWARD

131 J. Deng, P. Gudem, L. Larson, and P. Asbeck, “A High-Efficiency SiGe BiCMOS WCDMA Power Amplifier with Dynamic Current Biasing for Improved Average Efficiency,” Proceedings of 2004 IEEE RFIC Conference, pp. 361-364.

132 V. Aparin and L. Larson, “Analysis of Cross Modulation in WCDMA Receivers,” Proceedings of 2004 IEEE International Microwave Symposium, pp. 787-790.

133 F. Wang, A. Ojo, D. Kimball, P. Asbeck and L. Larson, “Envelope Tracking Power Amplifier with Pre-Distortion Linearization for WLAN 802.11g,” Proceedings of 2004 IEEE International Microwave Symposium, pp. 1543 – 1546, 2nd PLACE BEST STUDENT PAPER AWARD

134 V. Aparin, G. Brown, and L. Larson, “Linearization of CMOS LNA’s via Optimum Gate Biasing, Proceedings of 2004 International Symposium on Circuits and Systems, pp. 748-751.

135 K. Gard, L. Larson, and M. Steer, “Statistical Analysis of Spectral Regrowth in Wireless Nonlinear Circuits,” IEEE European Microwave Conference, 2004, Volume 2, Pp.:697 - 700.

136 V. Leung, J. Deng, P. Gudem and L. Larson, “Analysis of Envelope Signal Injection for Improvement of RF Amplifier Intermodulation Distortion,” Proceedings 2004 IEEE Custom Integrated Circuits Conference. 2004. pp. 133 – 136.

137 M. Li, I. Galton, L. Larson and P. Asbeck, “Correlation techniques for estimation of amplifier nonlinearity,” Radio and Wireless Conference, 2004 pp. 179 – 182.

138 J. Jamp and L. Larson, “A Coding Technique for Spectral Shaping UltraWideband Pulse Position Modulated Signals” Proc. 2004 IEEE Vehicular Technology Conference, Vehicular Technology Conference, 2004. pp. 1188 – 1191.

139 Y. Sun, P. Gudem, L. Larson, “A Multiple Sub-carrier Selection (MSCS) Diversity Architecture with Reduced Receiver Complexity for Wireless OFDM Applications” Proc. 2004 IEEE Vehicular Technology Conference, , 26-29 Sept. 2004 Pp.:439 - 442 Vol. 1.

140 J. Jensen, and L. Larson, “An 8bit 3GHz Si/SiGe HBT Sample-and-Hold,” Proceedings of 2004 Custom Integrated Circuits Conference, 2004. Pp.:655 – 658.

141 L. Larson, “SiGe HBT BiCMOS Technology as an Enabler for Next Generation Communications Systems,” Proceedings of 2004 IEEE European Microwave Conference, pp. 783-787.

142 J. Deng, P. Gudem, L.. Larson, D. Kimball and P. Asbeck, “A SiGe PA with Dual Dynamic Bias Control and Memoryless Digital Predistortion for WCDMA Handset Applications,” 2005 IEEE RFIC Conference, 4 pages. pp. 247-250

143 L. Larson, P. Asbeck, and D. Kimball, “Next Generation Power Amplifiers for Wireless Communications – Squeezing More Bits Out of Fewer Joules,” 2005 IEEE RFIC Conference, pp. 417 - 420. INVITED RESEARCH ARTICLE

144 K. Buisman, L.C.N. de Vreede, L.E. Larson , M. Spirito, A. Akhnoukh, Y. Lin, X. Liu, and L.K. Nanver, “Low-Distortion, Low-Loss Varactor-Based Adaptive Matching Networks, Implemented in a Silicon-on-Glass Technology,” 2005 IEEE RFIC Conference, pp. 389 – 392

145 L. Larson, “Circuit and System Design for Future Microwave Systems,” 2005 IEEE International Microwave Symposium, 4 pages. INVITED RESEARCH ARTICLE

146 K. Buisman, L.C.N. de Vreede, L.E. Larson , M. Spirito, A. Akhnoukh, Y. Lin, X. Liu, and L.K. Nanver, “”Distortion-Free” Varactor Diode Topologies for RF Adaptivity,” 2005 IEEE International Microwave Symposium-, 4 pages.

147 L. Larson, P. Asbeck, and D. Kimball, “Digital control of RF power amplifiers for next-generation wireless communications,” Proceedings of 35th European Solid-State Device Research Conference, 2005. ESSDERC 2005, pp. 39-44 INVITED PLENARY ARTICLE

148 D. Kimball, P. Draxler, J. Jeong, C. Hsia, S. Lanfranco, W. Nagy, K. Linthicum, L. Larson, and P. Asbeck, “50% PAE WCDMA base-station amplifier implemented with GaN HFETs,” IEEE Compound Semiconductor Integrated Circuit Symposium, 2005. 4 pages.

149 L. Larson, P. Asbeck, and D. Kimball “Challenges and opportunities for compound semiconductor devices in next generation wireless base station power amplifiers,” IEEE Compound Semiconductor Integrated Circuit Symposium, 2005. CSIC '05. pp. 1-4. INVITED PLENARY ARTICLE

150 W. Neo, X. Liu, Y. Lin, L. de Vreede, L. Larson, S. Spirito, A. Akhnoukh, A. de Graauw, and L. Nanver, “Improved hybrid SiGe HBT class-AB power amplifier efficiency using varactor-based tunable matching networks,” Proceedings of the Bipolar/BiCMOS Circuits and Technology Meeting, 2005, pp. 108 – 111

151 M. Spirito, M van der Heijden, M. Pelk, L. de Vreede, P. Zampardi, L. Larson, and J. Burghartz, “Experimental procedure to optimize out-of-band terminations for highly linear and power efficient bipolar class-AB RF amplifiers,” Proceedings of the Bipolar/BiCMOS Circuits and Technology Meeting, 2005, pp. 112 – 115.

152 M. Li, I. Galton, L. Larson, and P. Asbeck, “Nonlinearity estimation and spectral regrowth prediction of power amplifiers using correlation techniques,” 2005 IEEE Annual Conference on Wireless and Microwave Technology, 2005. pp. 170 – 173.

153 M. Ranjan and L. Larson, “An Analysis of Cross-modulation Distortion in Ultra Wideband OFDM Receivers” IEEE International Microwave Symposium, June 2006, pp. 872 – 875.

154 Y. Han, L. Larson and D. Lie, “A low-voltage 12GHz VCO in 0.13 um CMOS for OFDM applications” 2006 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, 4 pages, 3rd Place BEST STUDENT PAPER AWARD

155 R. Kodkani and L. Larson, “A 25 GHz quadrature voltage controlled ring oscillator in 0.12 um SiGe HBT,” 2006 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, 4 pp.

156 L. Larson, D. Kimball, P. Asbeck, P. Draxler, J. Deng, and M. Li, “Digital Predistortion Techniques for Linearized Power Amplifiers,” Proceedings of 2006 IEEE Asai-Pacific Microwave Conference (APMC) INVITED RESEARCH ARTICLE

157 B. Nejati and L. Larson, “An Area Optimized 2.5-V 10-b 200-MS/s CMOS DAC,” 2006 IEEE Custom Integrated Circuits Conference, pp. 161 – 164

158 J. Jamp and L. Larson, “Hardware Considerations for Spectral Encoded UWB Transmitters,” IEEE 2006 International Conference on Ultra-Wideband, Sept. 2006, pp. 623 – 628.

159 S. Park, L. Larson and L. Milstein, “Hidden Mobile Terminal Device Discovery in a UWB Environment,” IEEE 2006 International Conference on Ultra-Wideband, Sept. 2006, pp. 417 - 421

160 J. Popp, D. Lie, F. Wang, D. Kimball, and L. Larson, “Fully-integrated highly-efficient RF Class E SiGe power amplifier with an envelope-tracking technique for EDGE applications,” 2006 IEEE Radio and Wireless Symposium pp. 231 – 234.

161 D. Lie, J. Kennedy, D. Livezey, B. Yang, T. Robinson, N. Sornin, C. Saint, C.and L. Larson, "Circuit and System Design for a Homodyne W-CDMA Front-End Receiver RF IC," International Symposium on VLSI Design, Automation and Test, 2006, 4 pages.

162 H. Khatri, L. Larson, D. Lie, "On-chip monolithic filters for receiver interference suppression using bond-wire inductors," 2006 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, 4 pages.

163 P. Asbeck, L. Larson, D. Kimball, Y. Zhao; F. Wang, and D. Qiao, "High dynamic range, high efficiency power amplifiers for wireless communications," Proceedings of the 2006 IEEE Bipolar/BiCMOS Circuits and Technology Meeting, pp. 103 - 107 INVITED RESEARCH ARTICLE

164 M. Li, I. Galton, L. Larson, and P. Asbeck, "Nonlinearity estimation and spectral regrowth prediction of power amplifiers using correlation techniques," The 2005 IEEE Annual Conference on Wireless and Microwave Technology, 2005. pp. 170 – 173

165 M. Ranjan, and L. Larson, "A Sub-1mm2 Dynamically Tuned CMOS MB-OFDM 3-to-8GHz UWB Receiver Front-End," IEEE International Solid-State Circuits, 2006 Conference Digest of Technical Papers, pp. 438 – 445

166 M. Li, J. Deng, L. Larson, and P. Asbeck, "Nonideal effects of reconstruction filter and I/Q imbalance in digital predistortion," 2006 IEEE Radio and Wireless Symposium, pp. 259 – 263

167 L. Larson, P. Asbeck, and D. Kimball, "Multifunctional RF Transmitters for Next Generation Wireless Transceivers IEEE International Symposium on Circuits and Systems (ISCAS) 2007. , May 2007 Pp.:753 - 756 INVITED RESEARCH ARTICLE

168 H. Pan and L. Larson "Highly Linear Bipolar Transconductor For Broadband High-Frequency Applications with Improved Input Voltage Swing," IEEE International Symposium on Circuits and Systems, (ISCAS) 2007, Pp.:713 – 716

169 H. Pan, and L. Larson "Improved Dynamic Model of Fast-Settling Linear-in-dB Automatic Gain Control Circuit" IEEE International Symposium on Circuits and Systems, (ISCAS) 2007, pp. 681 – 684

170 R. Kodkani and L. Larson, "An Integrated 50-GHz SiGe Sub-Harmonic Mixer/Downconverter with a Quadrature Ring VCO," 2007 IEEE Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, Pp.:223 – 226. 3rd Place BEST STUDENT PAPER AWARD

171 B. Nejati, and L. Larson, "Power/Area Trade-Offs in Low-Power/Low-Area Unary-R-2R CMOS Digital-to-Analog Converters," IEEE International Symposium on Circuits and Systems, (ISCAS) 2007, Pp.:1473 – 1476

172 P. Kolinko and L. Larson, "Passive RF Receiver Design for Wireless Sensor Networks," IEEE/MTT-S International Microwave Symposium, 2007, Pp.:567 – 570.

173 K. Buisman, C. Huang, A. Akhnoukh, M. Marchetti, L. de Vreede, L. Larson, and L. Nanver, "Varactor Topologies for RF Adaptivity with Improved Power Handling and Linearity," IEEE/MTT-S International Microwave Symposium, 2007, Pp.:319 – 322

174 T. Hung, J. Rode, L. Larson and P. Asbeck, "H-Bridge Class-D Power Amplifiers for Digital Pulse Modulation Transmitters," IEEE 2007 Intl. Microwave Symposium, pp. 1091 - 1094

175 J. Qureshi, S. Kim, K. Buisman, C. Huang, M. Pelk, A. Akhnoukh, L. Larson, L. Nanver, and L. de Vreede, "A Low-Loss Compact Linear Varactor Based Phase-Shifter," 2007 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, Pp.:453 - 456

176 Y. Han and L. Larson, "A Low-Power 5GHz Transceiver in 0.13 um CMOS for OFDM Applications with Sub-mm2 Area" 2007 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, Pp.:361 - 364 – 3rd Place BEST STUDENT PAPER AWARD

177 R. Kodkani, L. Larson, "A 24-GHz CMOS Direct-Conversion Sub-Harmonic Downconverter," IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, 2007, Pp.:485 - 488

178 J. Jamp, J. Deng, and L. Larson, "A 10GS/s 5-bit Ultra-Low Power DAC for Spectral Encoded Ultra-Wideband Transmitters," 2007 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, Pp.:31 - 34

179 T. Hung; J. Rode, L. Larson, and P. Asbeck, "H-Bridge Class-D Power Amplifiers for Digital Pulse Modulation Transmitters," IEEE/MTT-S International Microwave Symposium, 2007, Pp.:1091 – 1094

180 T. Wooten and L. Larson, "A Decade Bandwidth, Low Voltage, Medium Power Class B Push-Pull Si/SiGe HBT Power Amplifier Employing Through-Wafer Vias," 2008 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, pp. 519-522.

181 Y. Han, K. Carter, L. Larson, A. Behzad, "A Low Insertion Loss, High Linearity, T/R Switch in 65 nm Bulk CMOS for WLAN 802.11g Applications ," 2008 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, pp. 681-684.

182 S. Kim, J.H. Qureshi, K. Buisman, L.E. Larson, and L.C.N. de Vreede, "A Low-Distortion, Low-Loss Varactor Phase-Shifter Based on a Silicon-on-Glass Technology," 2008 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, pp. 175-178.

183 N. Kim, V. Aparin, and L. Larson, "A Resistively Degenerated Wide-Band Passive Mixer with Low Noise Figure and +60dBm IIP2 in 0.18μm CMOS," 2008 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, pp. 185-188.

184 D. Kimball, M. Kwak, P. Draxler, J. Jeong, C. Hsia, C. Steinbeiser, T. Landon, O. Krutko, L. Larson, P. Asbeck, "High Efficiency WCDMA Envelope Tracking Base-Station Amplifier Implemented with GaAs HVHBTs." 2008 IEEE Compound Semiconductor and Integrated Circuits Symposium (CSICS).

185 L. Larson, D. Kimball, and P. Asbeck, "Linearity and Efficiency Enhancement Strategies for 4G Wireless Power Amplifier Designs," 2008 IEEE Custom Integrated Circuits Conference (CICC). Pp. 741-748. INVITED RESEARCH ARTICLE

186 N. Kim, L. Larson, V. Aparin, "A Highly Linear CMOS Inductor-less Embedded Filtering Receiver for a SAW-less Cellular System," 2008 IEEE Custom Integrated Circuits Conference (CICC). Pp. 729-732.

187 P. Kolinko, L. Larson, "Background estimation of power amplifier nonlinearities for OFDM signals" 2009 Radio Frequency Integrated Circuits Symposium, pp. 405 – 408.

188 P. Asbeck, L. Larson, D. Kimball, S. Pornpromlikit, J. Jeong, C Presti, T. Hung, F. Wang, Y. Zhao, "Design Options for High Efficiency Linear Handset Power Amplifiers," 2009 IEEE Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems. INVITED RESEARCH ARTICLE

189 A. Afsahi, A. Behzad, V. Magoon, and L. Larson, "Fully integrated dual-band power amplifiers with on-chip baluns in 65nm CMOS for an 802.11n MIMO WLAN SoC," 2009 IEEE Radio Frequency Integrated Circuits Symposium, pp. 365 - 368

190 S. Park, L. Larson, L. Milstein, "Phase noise effects on signal detection for UWB/WiMAX coexistence," 2008 IEEE Military Communications Conference, pp. 1 – 7

191 H. Khatri, L. Liu; T. Chang, P. Gudem, and L. Larson, "A SAW-less CDMA receiver front-end with single-ended LNA and single-balanced mixer with 25% duty-cycle LO in 65nm CMOS." 2009 IEEE Radio Frequency Integrated Circuits Symposium, pp. 13 – 16

192 M. Farazian, B. Asuri, Y. Zhao and L. Larson, "A dual-band CMOS CDMA transmitter without SAW and Driver Amplifier," IEEE 2009 Radio Frequency Integrated Circuits Symposium, pp. 523 – 526.

193 H. Khatri, P. Gudem, L. Larson, "Simulation of intermodulation distortion in passive CMOS FET mixers," 2009 IEEE Microwave Symposium Digest, pp. 1593 – 1596

194 T. Wooten, and L. Larson, Wooten, "A 1 Watt 1-5 GHz Class B push-pull Si/SiGe HBT power amplifier," 2009 IEEE Custom Integrated Circuits Conference, pp. 387 – 390

195 R. Kodkani and L. Larson, "A 24-GHz CMOS sub-harmonic mixer based zero-IF receiver with an improved active balun," 2009 IEEE Custom Integrated Circuits Conference, pp. 673 – 676

196 H. Khatri, P. Gudem, L. Larson, "A SAW-less CMOS CDMA receiver with active Tx filtering," 2009 IEEE Custom Integrated Circuits Conference, pp. 379 – 382

197 Y. Hong; D. Kimball, J. Yook, and L. Larson, "Decade-bandwidth planar balun using CPW-to-slotline transition for UHF applications," 2009 IEEE European Microwave Conference, pp. 061 – 064

198 L. Larson, D. Kimball, P. Asbeck, "Advanced digital linearization approaches for wireless RF power amplifiers," 2008 IEEE Dallas Circuits and Systems Workshop: System-on-Chip - Design, Applications, Integration, and Software, pp. 1 – 7. INVITED RESEARCH ARTICLE

199 C. Huang, K. Buisman, P.. Zampardi, L.Nanver, L. E. Larson, L. de Vreede, "Low Distortion Tunable RF Components, a Compound Semiconductor Opportunity," 2010 CS Mantech Conference, pp. 13-20. INVITED PLENARY TALK

200 A. Afsahi, A. Behzad, L. Larson, "A 65nm CMOS 2.4GHz 31.5dBm power amplifier with a distributed LC power-combining network and improved linearization for WLAN applications," 2010 IEEE Solid-State Circuits Conference, pp. 452 - 453

201 S. Park, V. Leung, L. Larson, "An Improved Wide-Dynamic Range Tunable RF

Interference Suppression Notch Filter," 2010 IEEE International Symposium on Circuits and Systems, 2010

202 Y. Hong, D. Kimball, J. Yook, P. Asbeck, L. Larson, "Switch-Controlled Multi-Octave Bandwidth Radial Power Divider/Combiner," 2010 IEEE Microwave Symposium Digest

203 H. Pan, L. Larson, "A linear-in-dB SiGe HBT wideband high dynamic range RF envelope detector," 2010 IEEE Radio Frequency Integrated Circuits Symposium pp. 267 – 270

204 S. Kim, P. Gudem, L. Larson, "A 44-GHz 8-element phased-array SiGe HBT transmitter RFIC with an injection-locked quadrature frequency multiplier," 2010 IEEE Radio Frequency Integrated Circuits Symposium pp. 453 – 456

205 L. Larson, P. Asbeck and D. Kimball , "4th Generation Wireless Transceiver Design," 2010 IEEE Bipolar Circuits and Technology Meeting, accepted for publication, INVITED RESEARCH ARTICLE

206 M. Farazian, P. Gudem, L. Larson, "Fast hopping carrier generation for 14-band multi-band OFDM UWB in digital CMOS," 2010 IEEE Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF), pp. 251 – 254, 2nd Place BEST STUDENT PAPER AWARD

207 A. Afsahi, L. Larson, "An Integrated 33.5dBm Linear 2.4GHz Power Amplifier in 65nm CMOS for WLAN Applications," 2010 IEEE Custom Integrated Circuits Conference, accepted for publication.

208 C. Huang, K. Buisman, L. Nanver, P. Zampardi, L. Larson, L.C.N. de Vreede, "Design concepts for semiconductor based ultra-linear varactor circuits (invited), IEEE Bipolar/BiCMOS Circuits and Technology Meeting (BCTM), 2010, Page(s): 204 – 211 INVITED RESEARCH ARTICLE

209 A. Arriagada, H. Pan, Jonmei Yan; D. Kimball, L. Larson, "A wideband high dynamic range frequency hopping transceiver for the Joint Tactical Radio System" MILCOM 2010, Page(s): 2009 - 2013

210 Pornpromlikit, S.; Dabag, H.; Hanafi, B.; Kim, J.; Larson, L.E.; Buckwalter, J.F.; Asbeck, P.M.; , "A Q-Band Amplifier Implemented with Stacked 45-nm CMOS FETs," Compound Semiconductor Integrated Circuit Symposium (CSICS), 2011 IEEE , vol., no., pp.1-4, 16-19 Oct. 2011

211 Nakatani, T.; Rode, J.; Kimball, D.F.; Larson, L.E.; Asbeck, P.M.; , "Digital polar transmitter using a watt-class current-mode class-D CMOS power amplifier," Radio Frequency Integrated Circuits Symposium (RFIC), 2011 IEEE , vol., no., pp.1-4, 5-7 June 2011

212 Hassan, M.; Myoungbo Kwak; Leung, V.W.; Chin Hsia; Yan, J.J.; Kimball, D.F.; Larson, L.E.; Asbeck, P.M.; "High efficiency envelope tracking power amplifier with very low quiescent power for 20 MHz LTE," Radio Frequency Integrated Circuits Symposium (RFIC), 2011 IEEE , vol., no., pp.1-4, 5-7 June 2011

213 Bagheri, M.; Bagheri, R.; Larson, L.E.; "A CMOS quadrature oscillator with deterministic output sequence," Silicon Monolithic Integrated Circuits in RF Systems (SiRF), 2011 IEEE 11th Topical Meeting on , vol., no., pp.1-4, 17-19 Jan. 2011

214 Kheirkhahi, A.; Asbeck, P. M.; Larson, L. E.; "Enhanced class-A/AB mobile terminal power amplifier efficiency by input envelope injection and 'self' envelope tracking," Microwave Symposium Digest (MTT), 2011 IEEE MTT-S International , vol., no., pp.1, 5-10 June 2011

215 Dabag, H.-T.; Joohwa Kim; Larson, L.E.; Buckwalter, J.F.; Asbeck, P.M.; , "A 45-GHz SiGe HBT amplifier at greater than 25 % efficiency and 30 mW output power," Bipolar/BiCMOS Circuits and Technology Meeting (BCTM), 2011 IEEE , vol., no., pp.25-28, 9-11 Oct. 2011

216 Korol, V.; Larson, L.E.; "A UWB CMOS SoC RF transmitter with analog baseband predistortion and on-package printed balun," Silicon Monolithic Integrated Circuits in RF Systems (SiRF), 2011 IEEE 11th Topical Meeting on , vol., no., pp.45-48, 17-19 Jan. 2011

217 Kheirkhahi, A.; Asbeck, P.M.; Larson, L.E.; "Enhanced Class-A/AB mobile terminal power amplifier efficiency by input envelope injection and "self" envelope tracking," Microwave Symposium Digest (MTT), 2011 IEEE MTT-S International , vol., no., pp.1-4, 5-10 June 2011.

218 Asbeck, P.; Larson, L.; Kimball, D.; Kwak, M.; Hassan, M.; Hsia, C.; Presti, C.; Scuderi, A.; , "Si IC development for high efficiency envelope tracking power amplifiers," Silicon Monolithic Integrated Circuits in RF Systems (SiRF), 2012 IEEE 12th Topical Meeting on , vol., no., pp.1-4, 16-18 Jan. 2012

219 Asbeck, P.; Larson, L.; Kimball, D.; Buckwalter, J.; , "CMOS handset power amplifiers: Directions for the future," Custom Integrated Circuits Conference (CICC), 2012 IEEE , vol., no., pp.1-6, 9-12 Sept. 2012 INVITED RESEARCH ARTICLE

220 Hassan, M.; Olson, C.; Kovac, D.; Yan, J.J.; Nobbe, D.; Kelly, D.; Asbeck, P.M.; Larson, L.E.; , "An Envelope-Tracking CMOS-SOS Power Amplifier with 50% Overall PAE and 29.3 dBm Output Power for LTE Applications," Compound Semiconductor Integrated Circuit Symposium (CSICS), 2012 IEEE , vol., no., pp.1-4, 14-17 Oct. 2012

221 Myoungbo Kwak; Kimball, D.; Presti, C.; Scuderi, A.; Santagati, C.; Jonmei Yan; Asbeck, P.; Larson, L.; , "Wideband high efficiency envelope tracking integrated circuit for micro-base station power amplifiers," Radio Frequency Integrated Circuits Symposium (RFIC), 2011 IEEE , vol., no., pp.1-4, 5-7 June 2011

222 Bagheri, Mahdi; Bagheri, Rahim; Larson, Lawrence E.; , "Wide tuning range CMOS LC quadrature oscillators based on quadrature mode switching," Circuits and Systems (ISCAS), 2012 IEEE International Symposium on , vol., no., pp.1752-1755, 20-23 May 2012

223 Agah, Amir; Hanafi, Bassel; Dabag, Hayg; Asbeck, Peter; Larson, Lawrence; Buckwalter, James; , "A 45GHz Doherty power amplifier with 23% PAE and 18dBm output power, in 45nm SOI CMOS," Microwave Symposium Digest (MTT), 2012 IEEE MTT-S International , vol., no., pp.1-3, 17-22 June 2012

224 Agah, A.; Dabag, H.; Hanafi, B.; Asbeck, P.; Larson, L.; Buckwalter, J.; , "A 34% PAE, 18.6dBm 42–45GHz stacked power amplifier in 45nm SOI CMOS," Radio Frequency Integrated Circuits Symposium (RFIC), 2012 IEEE , vol., no., pp.57-60, 17-19 June 2012

225 Myoungbo Kwak; Jinseong Jeong; Hassan, M.; Yan, J.J.; Kimball, D.F.; Asbeck, P.M.; Larson, L.E.; , "High efficiency wideband envelope tracking power amplifier with direct current sensing for LTE applications," Power Amplifiers for Wireless and Radio Applications (PAWR), 2012 IEEE Topical Conference on , vol., no., pp.41-44, 15-18 Jan. 2012

226 Hassan, M.; Larson, L.E.; Leung, V.W.; Asbeck, P.M.; , "Effect of envelope amplifier nonlinearities on the output spectrum of Envelope Tracking Power Amplifiers," Silicon Monolithic Integrated Circuits in RF Systems (SiRF), 2012 IEEE 12th Topical Meeting on , vol., no., pp.187-190, 16-18 Jan. 2012

227 Abdelhalem, S.H.; Gudem, P.S.; Larson, L.E.; , "A tunable differential duplexer in 90nm CMOS," Radio Frequency Integrated Circuits Symposium (RFIC), 2012 IEEE , vol., no., pp.101-104, 17-19 June 2012

228 Larson, L.; Abdelhalem, S.; Thomas, C.; Gudem, P.; , "High-Performance Silicon-Based RF Front-End Design Techniques for Adaptive and Cognitive Radios," Compound Semiconductor Integrated Circuit Symposium (CSICS), 2012 IEEE , vol., no., pp.1-4, 14-17 Oct. 2012 INVITED RESEARCH ARTICLE

229 Bagheri, M.; Bagheri, R.; Larson, L.E.; , "CMOS LC quadrature oscillators with enhanced tuning range by selective mode switching," Radio Frequency Integrated Circuits Symposium (RFIC), 2012 IEEE , vol., no., pp.297-300, 17-19 June 2012

230 Agah, A.; Dabag, H.; Asbeck, P.; Larson, L.; Buckwalter, J., "High-speed, High-efficiency millimeter-wave transmitters at 45 GHz in CMOS," Microwave Symposium Digest (IMS), 2013 IEEE MTT-S International , vol., no., pp.1,3, 2-7 June 2013

231 Kimball, D.; Yan, J.J.; Theilman, P.; Hassan, M.; Asbeck, P.; Larson, L., "Efficient and wideband envelope amplifiers for envelope tracking and polar transmitters," Power Amplifiers for Wireless and Radio Applications (PAWR), 2013 IEEE Topical Conference on , vol., no., pp.13,15, 20-20 Jan. 2013 (Invited Paper)

232 Ming Yin; Hao Li; Bull, C.; Borton, D.A.; Aceros, J.; Larson, L.; Nurmikko, A.V., "An externally head-mounted wireless neural recording device for laboratory animal research and possible human clinical use," Engineering in Medicine and Biology Society (EMBC), 2013 35th Annual International Conference of the IEEE , vol., no., pp.3109,3114, 3-7 July 2013

233 Abdelhalem, S.H.; Gudem, P.S.; Larson, L.E., "Hybrid transformer-based tunable integrated duplexer with antenna impedance tracking loop," Custom Integrated Circuits Conference (CICC), 2013 IEEE , vol., no., pp.1,4, 22-25 Sept. 2013

234 Hassan, M.; Asbeck, P.M.; Larson, L.E., "A CMOS dual-switching power-supply modulator with 8% efficiency improvement for 20MHz LTE Envelope Tracking RF power amplifiers," Solid-State Circuits Conference Digest of Technical Papers (ISSCC), 2013 IEEE International , vol., no., pp.366,367, 17-21 Feb. 2013

235 Agah, A.; Wei Wang; Asbeck, P.M.; Larson, L.; Buckwalter, J.F., "A 42 to 47-GHz, 8-bit I/Q digital-to-RF converter with 21-dBm Psat and 16% PAE in 45-nm SOI CMOS," Radio Frequency Integrated Circuits Symposium (RFIC), 2013 IEEE , vol., no., pp.249,252, 2-4 June 2013

236 Thomas, C.M.; Larson, L.E., "A 65 nm CMOS tunable 0.1-to-1.6 GHz distributed transmission line N-path filter with +10 dBm blocker tolerance," Custom Integrated Circuits Conference (CICC), 2014 IEEE Proceedings of the , vol., no., pp.1,4, 15-17 Sept. 2014.

237 Chul Kim; Sohmyung Ha; Thomas, C.; Joshi, S.; Jongkil Park; Larson, L.; Cauwenberghs, G., "A 7.86 mW +12.5 dBm in-band IIP3 8-to-320 MHz capacitive harmonic rejection mixer in 65nm CMOS," European Solid State Circuits Conference (ESSCIRC), ESSCIRC 2014 - 40th , vol., no., pp.227,230, 22-26 Sept. 2014

238 Larson, L.; Kimball, D.; Asbeck, P., "Wideband envelope tracking power amplifiers for wireless communications," Silicon Monolithic Integrated Circuits in Rf Systems (SiRF), 2014 IEEE 14th Topical Meeting on , vol., no., pp.32,37, 19-23 Jan. 2014 (Invited Talk)

239 Li, Hao; Thomas, Chris M.; Cauwenberghs, Gert; Larson, Lawrence E., "A BiCMOS 50 MHz input bandwidth, 1-to-16 channelizer optimized for low power analog signal classification," Bipolar/BiCMOS Circuits and Technology Meeting (BCTM), 2014 IEEE , vol., no., pp.76,79, Sept. 28 2014-Oct. 1 2014

240 Sarker, Subhradip; Nurmikko, Arto; Larson, Lawrence, "Comparative study of ultra-miniature RF coupling structures for intrabody networking applications," Biomedical Circuits and Systems Conference (BioCAS), 2014 IEEE , vol., no., pp.596,599, 22-24 Oct. 2014

241 Thomas, C.M.; Leung, V.W.; Larson, L.E., "A pseudorandom clocking scheme for a CMOS N-path bandpass filter with 10-to-15 dB spurious leakage improvement," in Radio and Wireless Symposium (RWS), 2015 IEEE , vol., no., pp.105-107, 25-28 Jan. 2015.

242 Thomas, C.M.; Larson, L.E., "A GaN HEMT N-path filter with +17 dBm jammer tolerance," in Radio and Wireless Symposium (RWS), 2015 IEEE , vol., no., pp.71-73, 25-28 Jan. 2015.

243 Chul Kim; Joshi, S.; Thomas, C.; Sohmyung Ha; Akinin, A.; Larson, L.; Cauwenberghs, G., "A CMOS 4-channel MIMO baseband receiver with 65dB harmonic rejection over 48MHz and 50dB spatial signal separation over 3MHz at 1.3mW," in VLSI Circuits (VLSI Circuits), 2015 Symposium on , vol., no., pp.C304-C305, 17-19 June 2015.

244 Larson, L., "RF and microwave technology challenges for Internet-of-Things applications," in Silicon Monolithic Integrated Circuits in RF Systems (SiRF), 2015 IEEE 15th Topical Meeting on , vol., no., pp.61-62, 26-28 Jan. 2015

245 C. M. Thomas, T. Quach, I. Telliez, T. Nakatani, D. Kimball and L. E. Larson, "A 250 nm GaN N-Path Filter IC with +27 dBm Blocker Tolerance," 2016 IEEE Compound Semiconductor Integrated Circuit Symposium (CSICS), Austin, TX, 2016, pp. 1-4.

246 L. Larson and A. Nurmikko, "Microwave communication links for brain interface applications," 2016 IEEE 16th Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF), Austin, TX, 2016, pp. 73-76.

247 A.R. Wichman; L. E. Larson, “Background measurement of RF system nonlinearity using spread-spectrum methods,” 90th ARFTG Microwave Measurement Symposium (ARFTG), 2017, pp. 1-4.

248 J. Lee et al., "Wireless Power and Data Link for Ensembles of Sub-mm scale Implantable Sensors near 1GHz," 2018 IEEE Biomedical Circuits and Systems Conference (BioCAS), Cleveland, OH, 2018, pp. 1-4.

249 V. W. Leung; J. Lee; S. Li; S. Yu; C. Kilfovle; L. Larson; A. Nurmikko; F. Laiwalla., "A CMOS Distributed Sensor System for High-Density Wireless Neural Implants for Brain-Machine Interfaces," ESSCIRC 2018 - IEEE 44th European Solid State Circuits Conference (ESSCIRC), Dresden, 2018, pp. 230-233.

250. J. Lee; F. Laiwalla; J. Jeong; C. Kilfoyle; L. Larson; A. Nurmikko; S. Li; S. Yu; V. W. Leung, “Wireless Power and Data Link for Ensembles of Sub-mm scale Implantable Sensors near 1GHz,” 2018 IEEE Biomedical Circuits and Systems Conference (BioCAS), 2018, pp.1-4.

251. J. Lee; E. Mok; J. Huang; L. Cui; A. Lee; V. Leung; P. Mercier; S. Shellhammer; L. Larson; P. Asbeck; R. Rao; Y. Song; A. Nurmikko; F. Laiwalla, “An Implantable Wireless Network of Distributed Microscale Sensors for Neural Applications,”9th International IEEE/EMBS Conference on Neural Engineering (NER) 2019 pp. 871-874.

252. F. Laiwalla; J. Lee; A. Lee; E. Mok; V. Leung; S. Shellhammer; Y. Song; L. Larson; A. Nurmikko, “A Distributed Wireless Network of Implantable Sub-mm Cortical Microstimulators for Brain-Computer Interfaces,” 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) pp. 6876-6879.

253. VW Leung, L Cui, S Alluri, J Lee, J Huang, E Mok, S Shellhammer, R Rao, L. Larson, A. Nurmikko, F. Laiwalla, “Distributed microscale brain implants with wireless power transfer and Mbps bi-directional networked communications,” 2019 IEEE Custom Integrated Circuits Conference (CICC), 1-4, 16, 2019

Patents

1 U.S. Patent # 4,682,149: "High Resolution Pipelined Digital-to-Analog Converter" (July 1987).
2 U.S. Patent # 4,872,010: "Analog-to-Digital Converter Made with Focused Ion Beam Technology", with J. Jensen, R. Walden, and A. Schmitz (October 1989).
3 U.S. Patent # 4,896.121: "Current Mirror for Depletion-Mode Field Effect Transistor Technology" (January 1990).
4 U.S. Patent # 4,951,303: "High Speed Digital Programmable Frequency Divider" (August 1990).
5 U.S. Patent # 4,977,403: "Digital Correction Circuit for Data Converters" (December 1990).
6 European Patent #E91303050.8: "HEMT Structure with Passivated Donor Layer", with M. Delaney, U. Mishra, and L. Nguyen (June 1991).
7 U.S. Patent # 5,049,522: "Semiconductive Arrangement Having Dissimilar, Laterally Spaced Layer Structures, and Process for Fabricating the Same", with W. Stanchina (September 1991).
8 U.S. Patent # 5,087,482: "Improved Electrostatically Movable Planar Transmission Line for Microwave Integrated Circuits" (March 1992).
9 U.S. Patent # 5,121,089: "Micro-Machined Switch and Method of Fabrication" (June 1992).
10 U.S. Patent # 5,146,117: "FET Logic Gate Whose Function is Determined by Ion Implantation" (September 1992).
11 U.S. Patent # 5,164,688: "Miniature Microwave and Millimeter Wave Tuner" (November 1992).
12 U.S. Patent # 5,168,249: "Miniature Microwave and Millimeter Wave Tunable Circuit" (December 1992).
13 U.S. Patent # 5,172,197: "HEMT Structure With Passivated Donor Layer" (December 1992).
14 U-.S. Patent # 5,175,521: "Miniature Dynamically Tunable Microwave and Millimeter Wave Device" (December 1992).
15 "Hybrid Bipolar/Field-Effect Power Transistor in Group III-V Material System" with P. Asbeck and J. Brown (September 1994).
16 U.S. Patent # 5,420,422: "N-Type Antimony-Based Strained Layer Superlattice", with T. Hasenberg and A. Brown (May 1995).
17 U.S. Patent # 5,489,549: "Method of Fabricating N-Type Antimony-Based Strained Layer Superlattice", with T. Hasenberg, A. Brown (February 1996).
18 U.S. Patent # 5,528,209: "Monolithic microwave integrated circuit and method for fabricating same," with P. MacDonald, M. Case, M. Chen, and D. Rensch (July, 1996).
19 U.S. Patent # 5,757,074: "Microwave/millimeter Wave Circuit Structure with Discrete Flip-Chip Mounted Elements" (1998). (From A.IV.20)
20 U.S. Patent # 5,629,241: "Microwave/millimeter Wave Circuit Structure with Discrete Flip-Chip Mounted Elements, and Method of Fabricating the Same" (1998). (From A.IV.21)
21 U.S. Patent # 5,835,128: "Wireless redistribution of television signals in a multiple dwelling unit" (1998). (From A.IV.22)
22 U.S. Patent # 5,554,865: "Integrated transmit/receive switch/low noise amplifier with dissimilar semiconductors devices" (1996). (From A.IV.19)
23 U.S. Patent # 6,310,906: "Chaotic Carrier Pulse Position Modulation Communication System and Method" H. Abarbanel, N. Rulkov, M. Suschik, L. Tsimring, L. Larson and A. Volkovskii (2001).
24 U.S. Patent # 6,304,623: "Precision timing generator system and method" (2001). J. Richards; P. Jett; L. Fullerton; W. Larry; L. Larson and D. Rowe.
25 US Patent #6,396,347: "Low-Power, Low-Noise Dual-Gain Amplifier Topology and Method," (2002), D. Lie and L. Larson
26 US Patent #6,421,389: "Baseband signal converter for a wideband impulse radio receiver", (2002)P. Jett, L. Larson, B. Pollack and D. Rowe.
27 United States Patent 6,504,447, "Microelectromechanical RF and microwave frequency power limiter and electrostatic device protection," D. Laney; M. Matloubian and L. Larson (2003)
28 US Patent 6,577,691, "Precision timing generator apparatus and associated methods," J. Richards, P. Jett, L. Fullerton, L. Larson, and D. Rowe (2003)

29 US Patent 6,636,573, “Precision timing generator system and method,” J. Richards, P. Jett, L. Fullerton, L. Larson and D. Rowe, (2003)
30 US Patent 6,735,424, “S-band low-noise amplifier with self-adjusting bias for improved power consumption and dynamic range in a mobile environment,” L. Larson and W. Xiong (2004)
31 US Patent 6,847,266, “Microelectromechanical RF and microwave frequency power regulator,” D. Laney, M. Matloubian, and L. Larson (2004)
32 US Patent 6,915,117, “Multistage modulation architecture and method in a radio,” P. Chominski; J. Kennedy, L. Larson; J. Park, (2005)
33 US Patent 6,917,268, “Lateral microelectromechanical system switch,” H. Deligianni; C. Jahnes, J. Lund, L. Larson (2005)
34 US Patent 6,937,663, “Baseband signal converter for a wideband impulse radio receiver,” P. Jett, L. Larson, B. Pollack; D. Rowe (2005)
35 US Patent 6,950,485, “Precision timing generator apparatus and associated methods,” P. Jett, L. Larson, B. Pollack; D. Rowe (2005)
36 US Patent 6,977,569 “Lateral microelectromechanical system switch,” H. Deligianni; C. Jahnes, J. Lund, L. Larson, (2005)
37 US Patent 7,567,123, “Adaptive bias current circuit and method for amplifiers,” V. Leung, P. Gudem, and L. Larson, (2010)
38 US Patent 7,652,532, “Correlation method for monitoring power amplifier,” M. Li, P. Asbeck, I. Galton, and L. Larson, (2010)
39 US Patent 6,828,858, “CMOS class AB power amplifier with cancellation of nonlinearity due to change in gate capacitance of a NMOS input transistor with switching,” L. Larson, C. Wang, (2008)
40 US Patent 7,902,585 “Linear variable voltage diode capacitor and adaptive matching networks”, L. Larson and LC deVreede.
41 US Patent 8,242,868 “Multiple sub-carrier selection diversity architecture and method for wireless OFDM, L. Larson, Y. Sun and P. Gudem (2013)
42 US Patent 9,876,518: “Capactive Passive Mixer Baseband Receiver with Harmonic Rejection,” C. Kim, G. Cauwnbergh, C. Thomas and L. Larson. 2018
43 US Patent 9,853,623, “High-Selectivity Passive Low-Loss Duplexer Filter.” 2018, L. Larson

Disclosures not issued:

US Patent Disclosure “U.S. Application No.: 61/724,255, 11/8/2012, “Broad-Band Lumped Transmission Line N-Path Filter ,” Chris Michael Thomas and Lawrence E. Larson.

Other Conference Proceedings Unpublished Plenary Talks

L. Larson, D. Kimball, and P. Asbeck, “Intelligent Transmitter Technology for Next Generation Wireless Transceivers,” IEEE 2008 International Gigahertz Conference, Chalmers, Sweden, 4 pages, INVITED PLENARY TALK

Abstracts of Non-refereed Conference Proceedings (research workshops or talks where a full proceedings is not published)

1 M. Iwamoto, J. Arun, G. Hanington, A. Abellora, P. Asbeck, and L. Larson, “Class S Delta-Sigma Amplifiers for Linear Applications: Efficiency Considerations,” *Proc. 1999 IEEE Topical Workshop on Power Amplifier for Wireless Communications,* Sept. 13-14, 1999.

2 C. Wang and L. Larson, “Analysis of a Microwave Class-E Power Amplifier with Finite Switching On-Resistance,” *Proc. 1999 IEEE Topical Workshop on Power Amplifier for Wireless Communications,* Sept. 13-14, 1999.

3 W. T. Thornton, D. Morgan, and L. Larson, “Results Presented for a Novel Predistortion Linearizer Designed for Use in the LMDS Transmit Band,” *Proc. 1999 IEEE Topical Workshop on Power Amplifier for Wireless Communications,* Sept. 13-14, 1999.

4 X. Zhang and L. Larson, “Gain and Phase Error Free LINC Transmitter,” *Proc. 1999 IEEE Topical Workshop on Power Amplifier for Wireless Communications,* Sept. 13-14, 1999.

5 H. Kobayashi, J. Hinrichs, L. Larson, and P. Asbeck, "The current-mode Class-D amplifier for microwave frequencies: fundamental analysis and simulations," *2000 IEEE Topical Workshop on Power Amplifiers for Wireless Communications*, Sept. 11-12, 2000.

6 C. Wang, L. Larson, and P. Asbeck, "Linear Class-AB power amplifier with nonlinear capacitor compensation," *2000 IEEE Topical Workshop on Power Amplifiers for Wireless Communications*, Sept. 11-12, 2000.

7 M. Iwamoto, J. Hinrichs, J. Arun, L. Larson, and P. Asbeck, "A push-pull bandpass delta-sigma class-S amplifier," *2000 IEEE Topical Workshop on Power Amplifiers for Wireless Communications*, Sept. 11-12, 2000.

8 M. Iwamoto, P. Chen, H. Kobayashi, L. Larson, P. Asbeck, “950 MHz HBT Extended Doherty for Wireless Handstes: Linearity Characteristics and CDMA Operation," *2001 IEEE Topical Workshop on Power Amplifiers for Wireless Communications*, Sept. 10-11, 2001.

9 M. Iwamoto, A. Williams, C. Wang, L. Larson, and P. Asbeck, "Analysis of Doherty amplifiers with finite output impedance effects," *2000 IEEE Topical Workshop on Power Amplifiers for Wireless Communications*, Sept. 11-12, 2000.

10 P. Asbeck, H. Kobayashi, M. Iwamoto, G. Hanington, S. Nam, and L. Larson, “Augmented Banp-pass nonlinearity model for power amplifier charachterization, Wa. *2001 IEEE Topical Workshop on Power Amplifiers for Wireless Communications*, Sept. 10-11, 2001.

11 Y. Zhao, M. Iwamoto, P. Asbeck, and L. Larson, “Using DSP to Improve PA Performance,” *IEEE Topical Workshop on Power Amplifiers for Wireless Communications, Sept. 2002.*

12 J. Deng, P. Gudem, L. Larson, and P. Asbeck, “High-Efficiency SiGe BiCMOS WCDMA Power Amplifiers with Dynamic Biasing Techniques,” *IEEE Topical Workshop on Power Amplifiers for Wireless Communications, Sept. 2003.*

13 Feipeng Wang, Donald Kimball, Lawrence Larson, and Peter Asbeck, “Envelope Tracking Efficiency Enhancement for 802.11 g Power Amplifier”, *2003 IEEE Topical Workshop on Power Amplifiers for Wireless Communications, San Diego, CA, 2003.*

14 Y. Zhao, M. Iwamoto, D. Kimball, L. E. Larson, and P. M. Asbeck, “A 900MHz Doherty Amplifier Implemented with Lumped Elements,” *2003 IEEE Topical Workshop on Power Amplifiers for Wireless Communications, San Diego, CA, 2003.*

15 M. Ranjan, S. Rosenbaum, J. Pusl, B. Coy, L. Larson, “A 5.2GHz SiGe Power Amplifier for Wireless Data and Media Applications ,” *2003 IEEE Topical Workshop on Power Amplifiers for Wireless Communications, San Diego, CA, 2003.*

16 V. Leung, P. Gudem, L. Larson, “Dynamically-Biased Driver Amplifier for W-CDMA Mobile Phone Transmitter Applications,” *2003 IEEE Topical Workshop on Power Amplifiers for Wireless Communications, San Diego, CA, 2003.*

17 J. Deng, P. Gudem, and L. Larson, “Intermodulation Distortion Analysis in SiGe HBT Amplifiers Using a Power-Dependent Coefficient Volterra Technique,” *IEEE Topical Workshop on Power Amplifiers for Wireless Communications, Sept. 2004.*

18 M. Li, I. Galton, L. Larson and P. Asbeck, UCSD, “Power Amplifier Nonlinearity Estimation and Predistortion with Correlation Techniques,” *IEEE Topical Workshop on Power Amplifiers for Wireless Communications, Sept. 2004.*

19 T. Hung, L. Larson, P. Asbeck, “CMOS Outphasing Class-D Power Amplifiers with Chireix Combiners” *IEEE Topical Workshop on Power Amplifiers for Wireless Communications, Sept. 2007*

20 Y. Hong, J. Jeong, D. Kimball, J. Yook, P. Asbeck, L. Larson, "Two-Stage Envelope Tracking Power Amplifiers for Basestation Application," *IEEE Topical Workshop on Power Amplifiers for Wireless Communications, Sept. 2009*

Other Presentations/Works (invited workshops, presentations, or short courses of a tutorial or overview nature)

1. L. Larson, "Research directions in chaotic digital communications devices," *SIAM Conference on Applications of Dynamical Systems*, Snowbird, Utah, May 2001. WORKSHOP PRESENTATION
2. L. Larson, “The Impact of Semiconductor Technology Evolution on Communication Systems,” Plenary Talk, International High-Tech Forum, Zhuhai, China, 2002 Plenary Speech
3. L. Larson, “The role of power amplifier in wireless telecommunications,” IEEE International Solid-State Circuits Conference Short Course Presentation, 2000. Short Course Presentation at International Conference
4. L. Larson, “Emerging Semiconductor Technologies and their Effect on the Communications Industry, Presentation to San Diego Telecom Council, June 2002. Industry Group Presentation

5 L. Larson, "Implementation of VCO design,*" 2000 IEEE Radio Frequency Integrated Circuit Symposium*, Anaheim, CA, June 13-19, 2000. WORKSHOP PRESENTATION

6 L. Larson, “Improved Techniques Utilizing Harmonic Termination Methods for Microwave and RF Circuit Design,” at “Introducing New Concepts in Nonlinear Network Design,” Workshop at 2002 IEEE MTT-S International Microwave Symposium, Seattle, WA. WORKSHOP PRESENTATION

7 L. Larson, “RF and Microwave Oscillator Design,” Workshop at 2003 IEEE International Microwave Symposium, Philadelphia, Pennsylvania. WORKSHOP PRESENTATION

8 L. Larson, “Next Generation Transmitter Architecture and Design,” Workshop at 2003 IEEE International Microwave Symposium, Philadelphia, Pennsylvania. WORKSHOP PRESENTATION

9 L. Larson, “Wireless System Design and Measurement Accuracy: State-of-the-Art and Future Needs for the Communications”, Workshop at 2004 IEEE International Microwave Symposium, Fort Worth, Texas. WORKSHOP PRESENTATION

10 L. Larson, “Analog/RF design in SiGe Processes,” IEEE International Solid-State Circuits Conference Short Course Presentation, 2004. Short Course Presentation at International Conference

11 P. Asbeck, J. Rode, I. Galton and L. Larson, “Algorithms and Amplifiers for Digital Generation of Microwave Signals with Time-varying Envelope” Workshop at 2005 IEEE International Microwave Symposium, Long Beach, CA WORKSHOP PRESENTATION

12 “Enabling RF Technologies for Software Defined /Cognitive Radios” Larry Larson, Workshop Presentation at International European Solid-State Circuits Research Conference, 2006 WORKSHOP PRESENTATION

13 “Power Supply Modulation Techniques for Power Amplifier Efficiency Enhancement,” Larry Larson, Feipeng Wang, Donald Kimball, and Peter Asbeck,” Workshop Presentation at International Microwave Symposium (IMS) 2006. WORKSHOP PRESENTATION
14 “Multi-Standard RFIC Transmitter Technology,” Lawrence Larson, Peter Asbeck, and Donald Kimball, Workshop Presentation at International Microwave Symposium (IMS) 2006. WORKSHOP PRESENTATION
15 “Efficiency Enhancement Techniques for WiMAX Power Amplifiers,” Lawrence Larson, Peter Asbeck, and Donald Kimball, Workshop Presentation at International Microwave Symposium (IMS) 2007. WORKSHOP PRESENTATION
16 “Software Defined /Cognitive Radios: RF and System Considerations” Lawrence Larson, Workshop Presentation at International Microwave Symposium (IMS) 2007. WORKSHOP PRESENTATION
17 “Reconfigurable Transmitters and Power Amplifiers” Lawrence Larson, Peter Asbeck, and Donald Kimball, Workshop Presentation at IEEE Radio Frequency Integrated Circuit Symposium (2007) WORKSHOP PRESENTATION
18 “Linearization of Highly-Efficient Monolithic Class E SiGe Power Amplifiers with Envelope-Tracking (ET) and Envelope-Elimination-and-Restoration (EER) at 900MHz,” D. Lie, J. Popp, F. Wang, D. Kimball, and L. Larson, 6th IEEE Dallas Circuits and Systems Workshop on System-on-Chip, 2007. DCAS 2007. WORKSHOP PRESENTATION
19 “Digital-Assisted Compensation of RF-Front-end Limitations,” Larry Larson Workshop Presentation at IEEE International Solid-State Circuits Conference (2008) WORKSHOP PRESENTATION
20 “Digitally Enhanced” RF Circuits, Lawrence Larson, Peter Asbeck, and Donald Kimball, Panel Presentation at IEEE International Solid-State Circuits Conference (2007) WORKSHOP PRESENTATION
21 “Power Supply Modulation Techniques for Power Amplifier Efficiency Enhancement,” Lawrence Larson, Peter Asbeck, and Donald Kimball, Workshop Presentation at IEEE International Solid-State Circuits Conference (2007**)** WORKSHOP PRESENTATION
22 “Digital Signal Processing Techniques for Linearity and Efficiency Enhancement of Envelope Tracking, EER, and Doherty Amplifiers,” Lawrence Larson, Peter Asbeck, and Donald Kimball, Workshop Presentation at IEEE Radio Frequency Integrated Circuit Symposium (2008) WORKSHOP PRESENTATION
23 “Low-Power Reconfigurable Transmitter Architectures” Lawrence Larson, Peter Asbeck, and Donald Kimball Workshop Presentation at IEEE Radio Frequency Integrated Circuit Symposium (2008) WORKSHOP PRESENTATION
24 “Bipolar-Based Power Amplifier Design Beyond Handsets and into MMIC: Design, Modeling, Characterization, Packaging, Reliability,” Larry Larson, Workshop Presentation at IEEE Bipolar Circuits and Technology Meeting (2007) WORKSHOP PRESENTATION
25 “Digitally Enhanced” RF Circuits” Lawrence Larson, Peter Asbeck and Don Kimball, Workshop Presentation at International Microwave Symposium (IMS) 2009. WORKSHOP PRESENTATION
26 “Packaging Options for Wireless Systems-on-a-Chip” Lawrence Larson, Workshop Presentation at International Microwave Symposium (IMS) 2009. WORKSHOP PRESENTATION
27 “Power Amplifier Integration Challenges for Highly Integrated Multi-Mode Transceivers,” L. Larson, Workshop Presentation at International Microwave Symposium (IMS) 2009 WORKSHOP PRESENTATION
28 “Power Amplifiers” Lawrence Larson, Peter Asbeck and Don Kimball, Workshop Presentation at IEEE Custom Integrated Circuits Confrence (CICC) 2009. WORKSHOP PRESENTATION
29 “Packaging Options for Wireless Systems-on-a-Chip”, Lawrence Larson, Panel Presentation, IEEE International Solid-State Circuits Conference (2009) WORKSHOP PRESENTATION
30 “Ubiquitous Wireless Communications,” L. Larson, Presentation to La Jolla Venture Capital Forum, April 2009 PRESENTATION
31 “Ubiquitous Wireless Communications,” June, 2009, SPAWAR TechBoard Presentation, PRESENTATION
32 “Design Techniques for Broadband Efficient Linear Power Amplifiers for Multi-Mode Wireless Applications” Lawrence Larson, Workshop Presentation at International Microwave Symposium (IMS) 2010 WORKSHOP PRESENTATION

33 “Low-Power Transmitters in Nanoscale CMOS ”Lawrence Larson, Peter Asbeck, and Donald Kimball, Workshop Presentation at IEEE Radio Frequency Integrated Circuit Symposium (2010) WORKSHOP PRESENTATION
34 “Ubiquitous Wireless Communications,” Presentation to Qualcomm Ventures 5/28/09 PRESENTATION
35 “Digital Signal Processing Techniques for Linearity and Efficiency Enhancement of Envelope Tracking, EER, and Doherty Amplifiers” Presentation at UCSB, April 2008 PRESENTATION
36 “Linearization of Power Amplifiers,” Csics 2010 Short Course WORKSHOP PRESENTATION
37 “Improving RF Transmitter Energy Efficiency for Future Generation Wireless Systems” Presentation to UC Irvine ECE Department Irvine, May, 2010. PRESENTATION
38 “RF and Microwave Challenges for Cognitive Radio and TV White Space Devices,” Presentation at GHz Center, annual Review, Chalmers University, Sweden, November, 2009. PRESENTATION
39 “Power Amplifier Technology” Panasonic 7/20/09 PRESENTATION
40 “Power Amplifier Technology” Huawei 7/28/09 PRESENTATION
41 “RF and Microwave Challenges for Cognitive Radio and TV White Space Devices” Huawei Cognitive Radio Panel 4/17/09 PRESENTATION
42 “Improving RF Transmitter Energy Efficiency for Future Generation Wireless Systems” Presentation to UC Riverside ECE Department 2/17/09 PRESENTATION
43 “Low-Power RF Circuit Trends for Wireless Communications” Broadcomm, 4/20/09. PRESENTATION
44 “RF and Microwave Challenges for Cognitive Radio and TV White Space Devices,” Presentation at California Institute of Technology, December, 2009. PRESENTATION
45: Wouk Lecture – Cal. Tech. June 2013. This is the main invited lecture given by the Division of Engineering at Cal Tech every year. PRESENTATION
46: “Envelope Tracking Power amplifiers for wireless Communications,” Huawei Power Amplifier Workshop, May, 2014.
47:"RF and microwave technology challenges for Internet-of-Things applications" was an invited talk at the 2015 IEEE 15th Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, Jan., 2015.
48: "RF and Microwave Challenges for Future Radio Spectrum Access", Northeastern ECE Distinguished Speaker Series, December 3, 2015.
49: "RF and Microwave Challenges for Future Radio Spectrum Access" Invited talk at the Radio Club of America's Technical Symposium, San Jose, CA, Nov. 2015.
50: "Overview of the School of Engineering at Brown," Presentation to Rhode Island Professional Engineers, Nov. 4, 2015
51: TBP Annual National Convention - Overview of the School of Engineering at Brown, Oct. 30, 2015
52: "Design Fundamentals for RF Receivers and Transmitters," IEEE BCTM short course, Oct. 2015
53: "Transformer-based duplexers for wireless communications," Presentation to Skyworks, Woburn, Mass, May, 2015,
54: "Internet-of-Things" IMS Panel Discussion, May, 2015.

Contracts and Grants (period 7/1/11- 2/1/23) Brown University

		Funding Agency	Total Funding	Period of Performance		Percent Effort
1	Efficient Linear All-Silicon Transmitter IC's (ELASTX)	**DARPA**	$1,550,000	3/11-12/13	Co-PI	20%
2	Cognitive radio Low-energy signal Analysis Sensor ICs (CLASIC)	**DARPA/SAIC**	$350,000	1/12-1/15	PI	100%
3	Wide Tuning Range RF Front-End	**DARPA/Maxcentric**	$30,000	7/12-7/13	PI	100%
4	Neural Engineering System Design (Nurmikko PI)	**DARPA**	~$1,300,000	4/17-10/18	Co-PI	~10%
5	NIST Prep - Boulder	**NIST**	~$6,600,000	1/18-1/22	PI	5%

Service

University Service

Brown University Committees:

- Knowledge District Working Group: Fall 2011
- COE Review Committee: Fall 2011
- Nelson Center RPG Fall 2015
- Ex-Officio Member of President's Cabinet, Provost Senior Deans, Capital Planning, Tenure and Promotion, University Resource Committee and Academic Planning Committee
- Provost Search Committee, Fall 2022

University of California (system-wide) Committees:

- UCSD representative on the UC MICRO Steering Committee from 1999-2000. This group met three times per year in Oakland to establish MICRO policy, review proposals, and plan MICRO strategy for the future.
- UCSD representative on the UC Discovery Grant "Communications and Networking" Steering Committee 2001-2006. This group met three times per year in Oakland. Reviewer of Discovery Grant proposals.

University of California – San Diego Committees:

- Department representative to the Academic Senate (1999-2000)
- Member of the *ad-hoc* committee to review Professor Craig as provost of the Eleanor Roosevelt College (2000).
- Member of the *ad-hoc* ethics review committee for Professor Michael Karin (1997-2000).
- Member of the UCSD Institute for Nonlinear Studies Steering Committee (1999-2005).
- Member of Five-Year Review Committee for Rady School Dean Sullivan (2008)

UCSD Jacobs School of Engineering Committees:

- Representative of Center for Wireless Communications to Jacobs School Council of Advisors, 2002-2006.

- Chair of the committee that nominated Professor Peter Asbeck for the Conexant Chair of Electrical and Computer Engineering (2002).
- Member of the Chair committee for Professor Rajesh Gupta (2002)
- Member of the Chair committee for Professor Larry Smarr (2002).
- Member of SAIC Chair Committee for Professor Ahmin Vahdat (2008)
- Chair of CMRR Chair Committee for Professor Paul Siegel (2007)
- UCSD JSOE Diversity Advisory Council – Chair of Working Group on Student Recruiting 2010-2011

UCSD California Institute for Telecommunications and Information Technology Committees:

- Member of the CALIT^2 Communications committee (2005) .
- Member of the CALIT^2 Building Dedication committee (2005) .
- Member of CALIT NRI Committee (2006-2008)
- Member of CALIT Steering Committee (2005-2007)

UCSD Center for Wireless Communications:

- Director, July 2001-July 2006. Co-Director January 2000-July 2001. The Director of the CWC is responsible for all aspects of Center operation, including budgeting, resource allocation, interaction with member companies, recruiting new members, organizing technical reviews, and helping to determine technical direction. The CWC had roughly 12 Member Companies, 25 faculty members, and an annual budget of approximately $2.5M and supported roughly 45 PhD students during my tenure as Director. The Center Director is responsible for organizing the semi-annual research review, as well as hosting the semi-annual Board meeting. I was also responsible for member interactions and recruitment, which typically involved meetings with over 40 companies per year, as well as many visits to our Member companies.
- Member, CWC Executive Steering Committee for 1998-2000.
- CWC Entre/Intra-preneurship Workshop Organizer (w. Professor Alon Orlitsky). Nov. 2007. Professor Orlitsky and I organized this highly successful CWC Workshop. It required solicitation of distinguished international invited speakers, organizing the venue location, promotion of the event, etc.

UCSD ECE Department Committees:

- Member Department Space Committee(1998-2000)
- Member Graduate Affairs Committee (2000-2001)
- Member Faculty Council (1997-1999 and 2001-2003)
- Member Center for Wireless Communications Five Year Review Committee (2000)
- Host ECE294 Friday Lecture series: Fall 1999.
- Chair Search Committee for Prof. G. Rebeiz (2003)
- Chair Search Committee for Prof. B. Song. (1999)
- Member Search Committee for Prof. J. Buckwalter (2006)
- Member Search Committee Computer Engineering (2007)
- Chair, ECE Space Committee (2007)
- Chair and/or Member of Five Department Ad-Hoc Review Committees (2005-2008)
- MS and M.Eng Advisor: Electronic Circuits and Systems : (2005-2011)

UCSD ECE Department Service:

- ECE Department Vice Chair (2007)
- ECE Department Chair (2007-2011)

Host of Visiting Scholars and Professors at UCSD:

I have acted as host to several visitors, who were resident Visiting Scholars or Visiting Professors, including Mr. Eriji Iriyama from Matsushita Electric Works(1998-2000), Professor Leo DeVreede from Technical University Delft (1999), and Professor KH Koo from the University of Inchon (2000), and Mr. Thomas Johansen, from TU Copenhagen (2001-2002) Prof. Hyun-Chang Park from Dongguk University (2002-2003), Professor Carlo Samori: Politechnico Milano (2006-2007) and Professor Jong-Gwan Yook: Yonsei University (2007-2008). As Director of the UCSD CWC, I played official host to approximately 10 CWC visiting scholars.

Professional Service

Editor:

- Associate Editor IEEE Transactions on Circuits and Systems (2008-2010)

Guest Editor:

- Guest Editor of the August 1999 Issue of the *IEEE Transactions on Microwave Theory and Techniques*. This involved solicitation of manuscripts, and coordinating the review and publication process.
- Guest Editor of the October 2000 Issue of the *IEEE Journal of Solid-State Circuits*. This involved solicitation of manuscripts, and coordinating the review and publication process.
- Guest Editor Special Issue on Multifunctional Circuits and Systems for Future Generations of Wireless Communications, with A. Tasic, and W Serdijn, 2009 *IEEE Transactions on Circuits and Systems II*, Volume: 55 , Issue: 4

IEEE Committees:

- Member Program Committee for the 1999 IEEE Custom Integrated Circuits Conference (CICC).
- Member Program Committee for the 1997-2002 IEEE Bipolar Circuits and Technology Meeting (BCTM) (Chair of the RF committee and panel session organizer)
- Member Program Committee for the 1999 IEEE Radio Frequency Integrated Circuits Conference,
- Member Program Committee for the 1998 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits.
- Founding Chairman, 1998 UCSD Center for Wireless Communications Conference in cooperation with the IEEE.
- Technical Program Chair 1999(founding), 2001, and 2003 IEEE Workshop on Power Amplifiers for Wireless Communications.
- General Chair 2000, 2002, 2004 and 2006 IEEE Workshop on Power Amplifiers for Wireless Communications.
- Member Program Committee for the 2004 IEEE Radio and Wireless Conference.
- Member Program Committee for the 2004 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits.
- Member Program Committee for the 2007 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits.
- Member Program Committee for the 2008 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits.

- Member Program Committee for the 2009 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits.
- Member Program Committee for the 2009 IEEE International conference on Ultra-Wideband
- IEEE Communications Society 2009 Administrative Committee Member – Technical Directions Sub-Committee
- Member Program Committee for the 2010 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2011 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2012 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2013 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2014 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2015 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2016 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits
- Member Program Committee for the 2017 IEEE Topical Symposium on High-Frequency Silicon Devices and Circuits

NAE Committees:

- National Academy of Engineering Computer Science and Telecommunications Board's Committee on Wireless Technology Prospects and Policy Options. (2003-2011). This study committee was established by the National Academies at the request of the National Science Foundation to conduct a comprehensive assessment of wireless technology and service and application trends and their implications for wireless spectrum management and policy, and published its final report in 2011.
- A member (2019) of the NAE visiting committee reviewing the NIST Boulder Communications Laboratory, whose findings were published January 2020. I led the Metrology Section group during the review, and drafted that Section of the final report

Paper and Proposal Reviewer:

- Paper Reviewer (1998-Present):
  - IEEE Transactions on Microwave Theory and Techniques,
  - IEEE Microwave and Guided Wave Letters,
  - IEEE Transactions on Vehicular Technology,
  - IEEE Communications Letters,
  - IEEE Journal of Solid-State Circuits,
  - IEEE Transactions on Circuits and Systems,
  - IEEE Transactions on Electron Devices,
  - IEE Electronics Letters.
- NSF Proposal Reviewer: (2003, 2004, 2009, 2010, 2011, 2012)
- NSF ECCS Program Review Panel Member 2011

Diversity Training

Attended the NSA ADVANCE/PAID Chair Retreat, October 10 to 12, 2007. This three day event provided me with intensive training on removing bias and promoting diversity in the recruiting, tenure and advancement process. I took the lessons of this training back to the ECE department and used it to implement improved recruitment and promotion policies.

Other Activities (Entrepreneurship, Consulting, etc).

Co-Founder: Aethercomm, Inc. (1999-Present, BOD Member). Co-Founder Renaissance Wireless (2004-2007), Co-Founder Nurlink (2017-2021)

Technical Advisory Board Member: Resonant Communication (2020-2022), LintrinsicIC (2021-present).

Consultant to Sierra Monolithics (1996-2011), Consultant for Qualcomm in 2015-2016.

I also taught several short courses (1988-2011) through UCLA Extension, UCSD Extension, Mead Microelectronics, and Besser and Associates.

Academic Honors, Fellowships, and Honorary Societies

Memberships

Fellow, IEEE -1999, Life Fellow, IEEE - 2022
Member, Eta Kappa Nu, Sigma Xi, Tau Beta Pi

Honors and Awards

Howard Hughes Doctoral Fellow: 1982 - 1986.
Hughes Research Laboratories Sector Patent Award: 1995 for my work on RF MEMS technology.
Co-Recipient of Lawrence Hyland Award - 1996: This is the highest technical achievement award at Hughes Electronics, for development of InP-based low-noise HEMTs for satellite communications in the years 1989-1994.
IBM Faculty Development Award: 2002
Co-Recipient of IBM Microelectronics General Managers Excellence Award (1999) for Development of Si/SiGe HBT Technology. This was for my research on the development of Si/SiGe HBT technology during the years from 1993-1998.
"Wireless Influencers 2002" one of the top 200 people selected internationally as the top influencers in the wireless industry for 2002. One of only 11 people selected from academia.
Co-Recipient (w. D. Jessie): IEEE Custom Integrated Circuits Conference: Best Invited Paper 2003
Co-Recipient (w. V. Leung and P. Gudem): 2nd place Semiconductor Research Corporation SiGe Design Competition 2003
Co-Recipient (w. V. Aparin): Best Student Paper Award – 1st place: IEEE Radio Frequency Integrated Circuits Conference 2004
Co-Recipient (w. F. Wang, P. Asbeck and D. Kimball): Best Student Paper Award – 2nd place: IEEE International Microwave Symposium 2004
Co-Recipient (w. Yiping Han) Best Student Paper Award – 3rd Place: 2006 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems
Co-Recipient (w. Yiping Han) Best Student Paper Award – 3rd place: IEEE Radio Frequency Integrated Circuits Conference 2007

Co-Recipient (w. Rahul Kodkani) Best Student Paper Award – 3rd Place: 2007 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems

Co-Recipient (w. Mohammad Farazian) Best Student Paper Award – 2nd Place: 2010 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems

Mohammad Farazian (PhD Student) – Analog Devices Best Student Designer Award 2008

Ali Afsahi (PhD Student) – Analog Devices Best Student Designer Award 2010

Co-Recipient (w. Mahdi Bagheri) Best Student Paper Award – 3rd Place: 2011 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems

Teaching

Regular Courses and Enrollment Figures at Brown University

Engn 0020 – Spring 2013 (w. Prof. E. Powell). Enrollment was 131. Score on "Teaching Effectiveness" was 1.71 (1 being best and 5 being worst).

ENGN 0020 Spring 2014 (w. Prof. E. Powell). Enrollment was 125. Score on "Teaching Effectiveness" was 1.75 (1 being best and 5 being worst).

ENGN 0020 Spring 2016 (w. Prof. Jason Harry). Enrollment was 108. Score on "Teaching Effectiveness" was 1.9 (1 being best and 5 being worst).

ENGN 0020 Spring 2017 (w. Prof. Jason Harry). Enrollment was 118. Score on "Teaching Effectiveness" was 2.17 (1 being best and 5 being worst).

ENGN 0520 Spring 2018 (w. Professor Jacob Rosenstein) Enrollment was 94. Score on "Teaching Effectiveness" was 1.75 (1 being best and 5 being worst).

ENGN 0520 Spring 2019 (w. Professor Jacob Rosenstein) Enrollment was 98. Score on "Teaching Effectiveness" was 1.69 (1 being best and 5 being worst).

ENGN 0520 Spring 2020 (w. Professor Farah Laiwalla) Enrollment was 97. Score on "Teaching Effectiveness" was 1.62 (1 being best and 5 being worst).

ENGN 0520 Spring 2021 (w. Professor Farah Laiwalla) Enrollment was 92. Score on "Teaching Effectiveness" was 1.46 (1 being best and 5 being worst).

Independent Studies at Brown University

- Three independent studies projects advised in Fall Semester 2011.
- One independent studies project advised in Fall Semester 2012.
- I supervised one undergraduate student research during 2013 and 2014 – Mr. Subhradip Sarkar. He also did an Honor's thesis with me in 2015.

Honors, Master's and PhD theses directed

- Master's Students Completed: 24 (UCSD) One (Brown University)
- Doctoral Students Completed: 30 (UCSD) One (Brown University)

S. Vora	Thesis and Research Advisor	MS (Degree Granted 98)
R. Langridge	Thesis and Research Advisor	MS (Degree Granted 99)
K. Yang	Thesis and Research Advisor	MS (Degree Granted 99)
W. Sun	Thesis and Research Advisor	MS (Degree Granted 00)
Y. Song	Research Advisor (w. B. Song)	MS (Degree Granted 01)
J. Roan	Research Advisor	MS (Degree Granted 02)
P. Nanawa	Research Advisor	MS (Degree Granted 02)
R. Apte	Research Advisor	MS (Degree Granted 03)
H. Ghajari	Research Advisor	MS (Degree Granted 03)
S. Sivakumar	Research Advisor	MS(Degree Granted 03)
Dayo Ojo	Research Advisor	MS(Degree Granted 04)
P. Sagazio	Research Advisor	MS(Degree Granted 04)
A. Ebaad	Research Advisor	MS(Degree Granted 04)
A. Yang	Research Advisor	MS(Degree Granted 04)
H. Ng	Research Advisor	MS(Degree Granted 04)
P. Lee	Research Advisor	MS(Degree Granted 04)
P. Yu	Research Advisor	MS(Degree Granted 04)
R. Pera	Research Advisor	MS (Degree Granted 05)
D. Cheng	Research Advisor	MS(Degree Granted 07)
John Keeler	Research Advisor	MS(Degree Granted 07)
Javier Molina	Research Advisor	MS (Degree Granted 09)
Howard Liu	Research Advisor	MS (Degree Granted 09)
Tony Lo	Research Advisor	MS (Degree Granted 09)
Anton Arrigada	Research Advisor	MS (Degree Granted 10)
Akaninyene Umoh	Research Advisor	MS (Degree Granted 11)
C. Kilfoyle	Research Adviser	ScM (Degree Granted 2017 Brown)

Doctoral Students:
Name of Student/Your Role (thesis adviser, research adviser, etc.)

X. Zhang	Dissertation and Research Advisor	PhD (Degree Granted 2001)
C. Wang	Dissertation and Research Advisor	PhD(Degree Granted 2003)
D. Jessie	Dissertation and Research Advisor	PhD(Degree Granted 2003)
D. Laney	Dissertation and Research Advisor	PhD(Degree Granted 2003)
J. Fairbanks	Dissertation and Research Advisor	PhD (Degree Granted 2003)
K. Gard	Dissertation and Research Advisor	PhD(Degree Granted 2003)
L. Sheng	Dissertation and Research Advisor	PhD(Degree Granted 2003)
R. Tenny	Dissertation and co-Advisor (w/ H. Abarbanel)	PhD(Degree Granted 2003)
V. Leung	Dissertation and Research Advisor	PhD(Degree Granted 2004)
V. Aparin	Dissertation and Research Advisor	PhD(Degree Granted 2005)
J. Jensen	Dissertation and Research Advisor	PhD(Degree Granted 2005)
J. Deng	Dissertation and Research Advisor	PhD(Degree Granted 2005)
M. Ranjan	Dissertation and Research Advisor	PhD(Degree Granted 2006)
F. Wang	Dissertation and Research Advisor	PhD (Degree Granted 2006)
J. Jamp	Dissertation and Research Advisor	PhD (Degree Granted 2007)
R. Kodkani	Dissertation and Research Advisor	PhD (Degree Granted 2009)

H. Khatri	Dissertation and Research Advisor	PhD (Degree Granted 2009)
M. Farazian	Dissertation and Research Advisor	PhD (Degree Granted 2009)
H. Pan	Dissertation and Research Advisor	PhD (Degree Granted 2010)
N. Kim	Dissertation and Research Advisor	PhD (Degree Granted 2010)
S. Kim	Dissertation and Research Advisor	PhD (Degree Granted 2010)
S. Park	Dissertation and Research Advisor	PhD (Degree Granted 2010)
M. Kwak	Dissertation and Research Advisor	PhD (Degree Granted 2011)
M. Hassan	Dissertation and Research Advisor	PhD (Degree Granted 2012)
A.Kheirkhi	Dissertation and Research Advisor	PhD (Degree Granted 2013)
A. Afsahi	Dissertation and Research Advisor	PhD (Degree Granted 2013)
A. Agah	Dissertation and Research Advisor	PhD (Degree Granted 2013)
S. Abdelhalem	Dissertation and Research Advisor	PhD (Degree Granted 2013)
C. Thomas	Dissertation and Research Advisor	PhD (Degree Granted 2015)
M. Bagheri	Dissertation and Research co-Advisor	PhD (Degree Granted 2018)
A. Wichman	Dissertation and Research Advisor	PhD (Degree Granted 2018 Brown)