

# Stanford

---



## Thomas Lee

Professor of Electrical Engineering

### Bio

---

#### BIO

Professor Lee's principal areas of professional interest include analog circuitry of all types, ranging from low-level DC instrumentation to high-speed RF communications systems. His present research focus is on CMOS RF integrated circuit design, and on extending operation into the terahertz realm.

#### ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering

#### PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

#### PROFESSIONAL EDUCATION

- ScD, MIT (1990)

#### LINKS

- <http://smirc.stanford.edu/people.html>: <http://smirc.stanford.edu/people.html>

### Teaching

---

#### COURSES

##### 2020-21

- Advanced Circuit Techniques: EE 308 (Spr)
- High-Frequency Circuit Design Laboratory: EE 251 (Win)
- Things about Stuff: EE 14N (Win)

##### 2018-19

- Advanced Circuit Techniques: EE 308 (Win)
- Circuits I: EE 101A (Win)
- High-Frequency Circuit Design Laboratory: EE 251 (Aut)
- Things about Stuff: EE 14N (Aut)

##### 2017-18

- Advanced Circuit Techniques: EE 308 (Win)
- Circuits I: EE 101A (Win)

- High-Frequency Circuit Design Laboratory: EE 251 (Aut)
- Things about Stuff: EE 14N (Aut)

## STANFORD ADVISEES

### Doctoral Dissertation Reader (AC)

Cheng Chen, Sanghyeon Park, Mahmoud Sawaby, Benjamin Wang, Po-Hsuan Wei, Stephen Weinreich, Jiale Xu

### Doctoral Dissertation Advisor (AC)

Richelle Smith, Yinuo Xu

### Master's Program Advisor

Ryan Brandt, Fang Qin

### Doctoral (Program)

George Alexopoulos, Elizabeth Cole, West Foster, Timothy McKenna, Yinuo Xu, Pumiao Yan, Yueming Zhuo

## Publications

---

### PUBLICATIONS

- **Dark Secrets of RF Design** *IEEE Solid-State Circuits Society Singapore Chapter, Singapore*  
Lee, T.  
2012
- **The Return of the Empty State: Vacuum Nanoelectronics for Terahertz Applications**  
Lee, T.  
2010
- **European Solid-State Circuits Conference, Athens, Greece**  
Kiaei, A., Bohsali, M., Bahai, A., Lee, T., H.  
2009
- **When Silicon Valley was 'Arc Alley**  
Lee, T.  
2009
- **High-Power Tunable Terahertz Generation based on Photoconductive Antenna Arrays**  
Jarrahi, M., Danielson, J., Lee, T., H.  
2008
- **Monolithic integration of GaAs/AlGaAs phase modulator and photodetector for RF photonics**  
Jarrahi, M., Miller, D., A. B., Lee, T., H.  
2008
- **A System for Multiplexed Direct Electrical Detection of DNA Synthesis**, *Sensors & Actuators*  
Anderson, E., P., Daniels, J., S., Yu, H., Karhanek, M., Lee, T., H., Davis, R., W.  
2008; B 129: 79–86
- **The Future of Wireless Technology in the Fourth age – The Internet of Things**  
Lee, T.  
2008
- **Simultaneous Measurement of Nonlinearity and Electrochemical Impedance for Protein Sensing Using Two-Tone Excitation**  
Daniels, J., S., Anderson, E., Lee, T., H., Pourmand, N.  
2008
- **Optical switching based on highspeed phased-array optical beam steering** *Applied Physics Letters*

- Jarrahi, M., Pease, R., F. W., Miller, D., A. B., Lee, T., H.  
2008; 92
- **High-speed optical beam-steering based on phased arrayed waveguides**  
Jarrah, M., Pease, R., F. W., Miller, D., A. B., Lee, T., H.  
2008
  - **A Label-free CMOS DNA Microarray based on Charge Sensing**  
Anderson, E., P., Daniels, J., S., Yu, H., Pourmand, N., Lee, T., H.  
2008
  - **RFIC Design & Implementation: An Introduction Plus** *IEEE short course, Singapore local Solid-State Circuits Society chapter, Singapore*  
Lee, T.  
2008
  - **A Low-verhead Fault Tolerance Scheme for TSV-based 3D Network on Chip Links**  
Loi, I., Mitra, S., Lee, T., H., Fujita, S., Benini, L.  
2008
  - **3D Nanoarchitectures with Carbon Nanotube Mechanical Switches for Future On-Chip Network Beyond CMOS Architecture** *IEEE TCA S-I Special Issue: Nanoarchitecture*  
Fujita, S., Nomura, K., Abe, K., Lee, T., H.  
2007
  - **A 10Gb/s Equalizer with Decision Feedback for High Speed Serial Links**  
Kiaei, A., Matinpour, B., Bahai, A., Lee, T., H.  
2007
  - **The History of the Integrated Circuit: A Random Walk**  
Lee, T.  
2007
  - **Engineering Perspectives on Alternative Energy**  
Lee, T.  
2007
  - **From Oxymoron to Mainstream: The Evolution and Future of RF CMOS**  
Lee, T., H.  
2007
  - **Optical Spatially Quantized High Performance Analog-to-digital Conversion**  
Jarrah, M., Miller, D., A. B., Fabian, R., Pease, W., Lee, T., H.  
2007
  - **RFID: Status, Promise and Challenges**  
Lee, T.  
2007
  - **Oscillator Phase Noise** *Santa Clara Valley IEEE Solid State Circuits Society (SSCS) Chapter Program, RFIC Design Short Course, Santa Clara, CA*  
Lee, T.  
2007
  - **Phase Noise in Oscillators**  
Lee, T.  
2007
  - **Things about stuff** *MESA Community Colleges Statewide Day, Noe Lozano*  
Lee, T.  
2006

- **The Past and Future of the Integrated Circuit**  
Lee, T.  
2006
- **A Programmable 0.18- $\mu$ m CMOS Electrochemical Sensor Microarray for Biomolecular Detection** *IEEE Sensors Journal*  
Hassibi, A., Lee, T., H.  
2006; 6-6: 1380-1388
- **Candidate THz Sources: The History and Future of Velocity-Modulated Devices** *Photonics West, San Jose, CA*  
Lee, T.  
2006
- **RF ID: Promise and Challenges**  
Lee, T.  
2006
- **Novel architecture based on floating gate CNT-NEMS switches and its application to 3D on-chip bus beyond CMOS architecture**  
Fujita, S., Nomura, K., Abe, K., Lee, T., H.  
2006
- **3D on-chip networking technology based on post-Silicon devices for Future Network on Chip**  
Fujita, S., Nomura, K., Abe, K., Lee, T., H.  
2006
- **Coupled Inverter Ring I/Q Oscillator for Low Power Frequency Synthesis**  
Xu, J., Verma, S., Lee, T., H.  
2006
- **Ordered and Chaotic Electrical Solitons: Communication Perspectives,** *IEEE Communications Magazine*  
Ham, D., Li, X., Denenberg, S., A., Lee, T., H., Ricketts, D., S.  
2006; 44 (12): 126-135
- **Device Physics: Electrical Solitons Come of Age** *Nature*  
Lee, T.  
2006; 440: 36-37
- **First-Hand Tales of Successful Entrepreneurs** *MIT Club Semiconductor Program*  
Lee, T.  
2005
- **A Programmable Electrochemical Biosensor Array in 0.18 $\mu$ m Standard CMOS**  
Hassibi, A., Lee, T.  
2005
- **Biological Shot-noise and Quantum-Limited SNR in Affinity-Based Biosensor** *Journal of Applied Physics*  
Hassibi, A., Zahedi, S., Navid, R., Dutton, R., W., Lee, T., H.  
2005; 97 (84701): 8
- **A 17.1mW, 0.66mm<sup>2</sup>, Direct Conversion Receiver for 1Mb/s Cable Replacement**  
Verma, S., Xu, J., Hamada, M., Lee, T., H.  
2005
- **A 77GHz Monolithic IMPATT Transmitter in Standard CMOS Technology**  
Al-Attar, T., Hassibi, A., Lee, T., H.  
2005
- **A Constant-Frequency Method for Improving Light-Load Efficiency in Synchronous Buck Converters** *IEEE Power Electronics Letters*  
Mulligan, M., D., Broach, B., Lee, T., H.  
2005; 3: 24-29

- **High Dynamic Range Programmable CMOS Front-End Filter with a Tuning Range from 1850 to 2400 Mhz** *Analog Integrated Circuits and Signal Processing*  
Christensen, K., Lee, T., H., Bruun, E.  
2004; 42: 55-63
- **Maximum a Posteriori (MAP) Estimator for Polymerase Chain Reaction (PCR) Processes**  
Kakavand, H., O'Brien, D., Hassibi, A., Lee, T., H.  
2004
- **Effects of Scaling on the SNR and Speed of Biosensors**  
Hassibi, A., Lee, T., H., Navid, R., Dutton, R., W., Zahedi, S.  
2004
- **Feedback Linearization of RF Power Amplifiers**  
Dawson, J., Lee, T.  
Kluwer Academic Press.2004
- **Planar Microwave Engineering**  
Lee, T.  
Cambridge University Press.2004
- **Novel Functional Logic Circuits Based on 3D Emerging Memory Cells** *3-D Architectures for Semiconductor Integration and Packaging – Understanding the Impact on Materials, Processes, and Markets, Burlingame, CA*  
Fujita, S., Lee, T.  
2004
- **Lateral IMPATT Diodes in Standard CMOS Technology** *International Electron Devices Meeting Technical Digest, San Francisco, CA*  
Al-Attar, T., Mulligan, M., D., Lee, T., H.  
2004
- **Close-in Phase Noise in Electrical Oscillators**  
Navid, R., Jungemann, C., Lee, T., H., Dutton, R., W.  
2004
- **A Comprehensive Study of Noise Processes in Electrode-electrolyte Interfaces** *Journal of Applied Physics*  
Hassibi, A., Navid, R., Dutton, R., W., Lee, T., H.  
2004; 96: 1074-1082
- **Wireless Transceiver Building Blocks** *Stanford Engineering & Science Institute short course*  
Lee, T.  
2004
- **Effects of Scaling on the SNR and Speed of Biosensors**  
Hassibi, A., Lee, T., H., Navid, R., Dutton, R., W., Zahedi, S.  
2004
- **A Stochastic Model and Simulation Algorithm for Polymerase Chain Reaction (PCR) Systems**  
Hassibi, A., Kakavand, H., Lee, T., H.  
2004
- **A unified model for injection-locked frequency dividers** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Verma, S., Rategh, H. R., Lee, T. H.  
2003; 38 (6): 1015-1027
- **A multiply-by-3 coupled-ring oscillator for low-power frequency synthesis** *Symposium on VLSI Circuits*  
Verma, S., Xu, J. F., Lee, T. H.  
JAPAN SOCIETY APPLIED PHYSICS.2003: 189–192
- **512-Mb PROM with a Three-dimensional Array of Diode/antifuse Memory Cells** *IEEE Journal of Solid-State Circuit*  
Johnson, M., Al-Shamma, A., Bosch, D., Crowley, M., Farmwald, M., Fasoli, L., Lee, Thomas, H.

---

2003; 38: 1920-1928

- **Lumped, Inductorless Oscillators: How Far Can They Go?**  
Navid, R., Lee, T., H., Dutton, R., W.  
2003
- **Bioluminescence Regenerative Cycle (BRC) system for Nucleic Acid Quantification Assays**  
Hassibi, A., Lee, T., H., Davis, R., W., Pourmand, N.  
2003
- **Completely DC-free Direct Sequence Spectrum Spreading Scheme for Low Power, Low Cost, Direct Conversion Transceiver**  
Hamada, M., Verma, S., Xu, J., Lee, T., H.  
2003
- **Automatic Phase Alignment for a Fully Integrated CMOS Cartesian Feedback Power Amplifier System**  
Dawson, J., Lee, T.  
2003
- **Volumetric Ultrasound Imaging Using 2-D Capacitive Micromachined Ultrasonic Transducer Arrays (CMUTs): Initial Results**  
Oralkan, O., Ergun, A., S., Cheng, C., H., Johnson, J., A., Karaman, M., Lee, T., H.  
2002
- **Capacitive Micromachined Ultrasonic Transducer Arrays for Acoustic Imaging** *IEEE Transactions on Ultrasonics Ferroelectrics and Frequency Control*  
Oralkan, O., Ergun, A., Sanli, Karaman, M., Demirci, U., Kaviani, K., Lee, T.  
2002; 49: 1596-1610
- **Multi-GHz Frequency Synthesis and Division**  
Rategh, H., Lee, T.  
Kluwer Academic Press.2001
- **Bandwidth extension in CMOS with optimized on-chip inductors** *IEEE Custom Integrated Circuits Conference*  
Mohan, S. S., Hershenson, M. D., Boyd, S. P., Lee, T. H.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2000: 346-55
- **The equivalence of van der Ziel and BSIM4 models in modeling the induced gate noise of MOSFETs** *IEEE International Electron Devices Meeting (IEDM)*  
Goo, J. S., Liu, W., Choi, C. H., Green, K. R., Yu, Z. P., Lee, T. H., DUTTON, R. W.  
IEEE.2000: 811-814
- **Measuring and Modeling the Effects of Substrate Noise on the LNS for a CMOS GPS Receiver**  
Xu, M., Su, D., Shaeffer, D., Lee, T., Wooley, B.  
2000
- **Automatic Phase Alignment for High Bandwidth Cartesian Feedback Power Amplifiers**  
Dawson, J., Lee, T.  
2000
- **Oscillator Phase Noise: A Tutorial** *IEEE Journal of Solid-State Circuits*  
Lee, T., H., Hajimiri, A.  
2000; 35: 326-336
- **Circuit Techniques for CMOS RF ICs**  
Lee, T.  
2000
- **CMOS RF Integrated Circuits at 5GHz and Beyond**  
Lee, T., Wong, S.  
2000
- **A CMOS Frequency Synthesizer with an Injection-Locked Frequency Divider for a 5-GHz Wireless LAN Receiver** *IEEE Journal of Solid-State Circuits*  
Rategh, H., Samavati, H., Lee, T.

---

2000; 35: 780-787

- **Guidelines for the power constrained design of a CMOS tuned LNA** *International Conference on Simulation of Semiconductor Processes and Devices*  
Goo, J. S., Oh, K. H., Choi, C. H., Yu, Z. P., Lee, T. H., DUTTON, R. W.  
IEEE.2000: 269–272
- **Optimal Allocation of Local Feedback in Multistage Amplifiers via Geometric Programming**  
Dawson, J., Boyd, S., Hershenson, M., del Mar, Lee, T.  
2000
- **CMOS RF Integrated Circuits at 5GHz and Beyond**  
Lee, T., Wong, S.  
2000
- **A 5-GHz CMOS Wireless LAN Receiver Front End** *IEEE Journal of Solid-State Circuits*  
Samavati, H., Rategh, H., Lee, T.  
2000; 35: 765-772
- **A 0.3- $\mu$ m CMOS 8-Gb/s 4-PAM Serial Link Transceiver** *IEEE Journal of Solid-State Circuits*  
Farjad-Rad, R., Yang, C., Horowitz, M., Lee, T.  
2000; 35: 757-764
- **Simple accurate expressions for planar spiral inductances** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Mohan, S. S., Hershenson, M. D., Boyd, S. P., Lee, T. H.  
1999; 34 (10): 1419-1424
- **A portable digital DLL for high-speed CMOS interface circuits** *Symposium on VLSI Circuits*  
Garlepp, B. W., Donnelly, K. S., Kim, J., Chau, P. S., Zerbe, J. L., Huang, C., Tran, C. V., Portmann, C. L., Stark, D., Chan, Y. F., Lee, T. H., Horowitz, M. A.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.1999: 632–44
- **Jitter and Phase Noise in Ring Oscillators** *IEEE Journal of Solid-State Circuits*  
Hajimiri, A., Limotyrakis, S., Lee, T.  
1999; 34: 790-804
- **RF Noise Simulation for Submicron MOSFETs Based on Hydrodynamic Model**  
Goo, J., Choi, C., Morifuji, E., Sasaki, H., Momose, H., Yu, Z., Lee, Thomas, H.  
1999
- **A 5GHz, 1mW CMOS Voltage-Controlled Differential Injection-Locked Frequency Divider**  
Rategh, H., Samavati, H., Lee, T.  
1999
- **Superharmonic Injection-Locked Frequency Dividers** *IEEE Journal of Solid-State Circuits*  
Rategh, H., Lee, T.  
1999; 34: 813-821
- **Phase Noise in Oscillators: A Tutorial**  
Lee, T.  
1999
- **Optimal Design of a CMOS Op-amp via Geometric Programming** *Applied and Computational Control, Signals and Circuits*  
Lee, T.  
Birkhauser.1999: 1
- **Design Issues in CMOS Differential LC Oscillators** *IEEE Journal of Solid-State Circuits*  
Hajimiri, A., Lee, T.  
1999; 34: 717-724
- **A Linear, Time-Varying Theory of Phase Noise in Oscillators**  
Lee, T.

1999

- **A 0.3mm CMOS 8Gb/s 4-PAM Serial Link Transceiver**  
Farjad-Rad, R., Yang, C., Horowitz, M., Lee, T.  
1999
- **Issues in High Frequency Noise Simulation for Deep Submicron MOSFETs**  
Goo, J., Choi, C., Dannerville, F., Yu, Z., Lee, T., Dutton, R.  
1999
- **Low-Power Dividerless Frequency Synthesis Using Aperture Phase Detection** *IEEE Journal of Solid-State Circuits*  
Shahani, D., Shaeffer, Mohan, S., Samavati, H., Rategh, H., Hershenson, M., del Mar, Xu, M., Lee, Thomas, H.  
1999; 33: 2232-2239
- **Monolithic CMOS Distributed Amplifier and Oscillator**  
Kleveland, C., Diaz, Vook, D., Madden, L., Lee, T., Wong, S.  
1999
- **CMOS RF: (Still) No Longer an Oxymoron**  
Lee, T.  
1999
- **GPCAD: A Tool for CMOS Op-Amp Synthesis**  
Hershenson, M., del Mar, Boyd, S., Lee, T.  
1999
- **A 2.125 Gbaud 1.6k# Transimpedance Preamplifier in 0.5 $\mu$ m CMOS**  
Mohan, S., Lee, T.  
1999
- **A 12.4mW CMOS Front-End for a 5GHz Wireless-LAN Receiver**  
Samavati, H., Rategh, H., Lee, T.  
1999
- **Design and Optimization of LC Oscillators**  
Hershenson, M., del Mar, Hajimiri, A., Mohan, S., Boyd, S., Lee, T.  
1999
- **RF Passive IC Components** *in The VLSI Handbook*  
Lee, T.  
edited by Chen, W.  
CRC Press.1999: 1
- **A 0.4- $\mu$ m CMOS 10-Gb/s 4-PAM Pre-emphasis Serial Link Transmitter** *IEEE Journal of Solid-State Circuits*  
Farjad-Rad, R., Yang, C., Horowitz, M., Lee, T.  
1999; 34: 580-585
- **A 5GHz, 32mW CMOS Frequency Synthesizer with an Injection-Locked Frequency Divider**  
Rategh, H., Samavati, H., Lee, T.  
1999
- **Optimization of Inductor Circuits via Geometric Programming**  
Hershenson, M., del Mar, Mohan, S., Boyd, S., Lee, T.  
1999
- **The Design of Low Noise Oscillators**  
Hajimiri, A., Lee, T.  
Kluwer Academic Press.1999
- **The Design and Implementation of Low-Power CMOS Radio Receivers**  
Shaeffer, D., K., Lee, T.



Kluwer Academic Press.1999

- **Phase Noise in CMOS Differential LC Oscillators**  
Hajimiri, Lee, T.  
1998
- **Ultra-Low Resistance, Through-Wafer Via (TWV) Technology and its Applications in Three Dimensional Structures on Silicon** *Japanese Journal of Applied Physics, Part 1, Hiroshima, Japan*  
Soh, H., Yu, C., McCarthy, A., Ryu, C., Lee, T., Wong, S.  
1998; 38: 2393-2396
- **A Portable Digital DLL Architecture for CMOS Interface Circuits**  
Garlepp, Donnelly, K., Kim, J., Chau, P., Zerbe, J., Huang, C., Lee, Thomas, H.  
1998
- **Superharmonic Injection Locked Oscillators as Low Power Frequency Dividers**  
Rategh, H., Lee, T.  
1998
- **The Design of CMOS Low-Noise Amplifiers**  
Lee, T.  
1998
- **A General Theory of Phase Noise in Oscillators** *IEEE Journal of Solid-State Circuits*  
Hajimiri, A., Lee, T.  
1998; 33: 179-194
- **Automated Design of Folded-Cascode Op-Amps with Sensitivity Analysis**  
Hershenson, M., del Mar, Boyd, S., Lee, T.  
1998
- **Fractal Capacitors** *IEEE Journal of Solid-State Circuits*  
Samavati, H., Hajimiri, A., Shahani, A., Nasserbakht, G., Lee, T.  
1998; 33: 2035-2041
- **A 115mW, 0.5- $\mu$ m CMOS GPS Receiver with Wide Dynamic-Range Active Filters** *IEEE Journal of Solid-State Circuits*  
Shaeffer, D., Shahani, A., Mohan, S., Samavati, H., Rategh, H., Hershenson, M., del Mar, Lee, Thomas, H.  
1998; 33: 2219-2231
- **Analysis and Optimization of Accumulation-Mode Varactor for RF ICs**  
Soorapanth, T., Yue, C., Shaeffer, D., Lee, T., Wong, S.  
1998
- **Low Phase Noise Ring Oscillators for Frequency Synthesis**  
Betancourt-Zamora, R., Lee, T.  
1998
- **Fractal Capacitors**  
Samavati, H., Hajimiri, A., Shahani, A., Nasserbakht, G., Lee, T.  
1998
- **A 115mW CMOS GPS Receiver**  
Shaeffer, Shahani, A., Mohan, S., Samavati, H., Rategh, H., Hershenson, M., del Mar, Lee, Thomas, H.  
1998
- **50-GHz Interconnect Design in Standard Silicon Technology**  
Kleveland, S., Wong, Lee, T.  
1998
- **A 0.4 $\mu$ m CMOS 10-Gb/s 4-PAM Pre-Emphasis Serial Link Transmitter**  
Farjad-Rad, R., Yang, C., Horowitz, M., Lee, T.

1998

- **A 1.4-GHz 3-mW CMOS LC Low Phase Noise VCO Using Tapped Bond Wire Inductances**  
Ahrens, T., Lee, T.  
1998
- **Modeling and characterization of on-chip transformers** *International Electron Devices Meeting (IEDM)*  
Mohan, S. S., Yue, C. P., Hershenson, M. D., Wong, S. S., Lee, T. H.  
IEEE.1998: 531-534
- **CMOS VCOs for Frequency Synthesis in Wireless Biotelemetry**  
Betancourt-Zamora, R., Lee, T.  
1998
- **Recent Progress in CMOS RF Integrated Circuits**  
Lee, T.  
1998
- **Circuit Techniques in a 266-MHz MMX-Enabled Processor** *IEEE Journal of Solid-State Circuits*  
Draper, M., Crowley, Holst, J., Favor, G., Schoy, A., Trull, J., Meir, A., Ben, Lee, Thomas, H.  
1997; 32: 1650-1664
- **A 12-mW Wide Dynamic Range CMOS Front-End for a Portable GPS Receiver** *IEEE Journal of Solid-State Circuits*  
Shahani, D., Shaeffer, Lee, T.  
1997; 32: 2061-2070
- **A 12mW Wide Dynamic Range CMOS Front-End for a Portable GPS Receiver**  
Shahani, D., Shaeffer, Lee, T.  
1997
- **A 1.5mW, 200MHz CMOS VCO for Wireless Telemetry**  
Zamora, R., Betancourt, Hajimiri, A., Lee, T.  
1997
- **A 1.5V, 1.5 GHz CMOS Low-Noise Amplifier** *IEEE Journal of Solid-State Circuits*  
Shaeffer, D., Lee, T.  
1997; 32: 745-759
- **CMOS RF: No Longer an Oxymoron**  
Lee, T.  
1997
- **An X86 Microprocessor with Multi-Media Extensions**  
Draper, M., Crowley, Holst, J., Favor, G., Schoy, A., Meir, A., Ben, Trull, J., Lee, Thomas, H.  
1997
- **RF Linearity of Short-Channel MOSFETs**  
Soorapanth, T., Lee, T.  
1997
- **Physical Modeling of Enhanced High-Frequency Drain and Gate Current Noise in Short-Channel MOSFETs**  
Klimovitch, T., Lee, Yamamoto, Y.  
1997
- **The Design of CMOS Radio-Frequency Integrated Circuits**  
Lee, T.  
Cambridge University Press.1997
- **An Equalization Scheme for 10Gb/s 4PAM Signaling over Long Cables**  
Rad, R., Farjad, Yu, K., Lee, T.

1997

- **CMOS RF: No Longer an Oxymoron**  
Lee, T.  
1997
- **A 155MHz Delay- and Phase-Locked Loop** *Monolithic Phase-Locked Loops*  
Lee, T.  
edited by Razavi, B.  
IEEE Press.1997: 1
- **CMOS Operational Amplifier Design and Optimization via Geometric Programming**  
Hershenson, M., del Mar, Boyd, S., Lee, T.  
1997
- **A 1.6GHz 0.5mW CMOS LC Low Phase Noise VCO Using Bond Wire Inductance**  
Ahrens, T., Hajimiri, A., Lee, T.  
1997
- **A 600MHz Superscalar RISC Microprocessor with Out-of-Order Execution**  
Gieseke, R., Allmon, Bailey, D., Benschneider, B., Britton, S., Clouser, J., III, H., Fair, Lee, Thomas, H.  
1997
- **A 160MHz 32b 0.5W CMOS RISC Microprocessor** *IEEE Journal of Solid-State Circuits*  
Montanaro, J., Witek, R., Anne, K., Black, A., Cooper, E., Dobberpuhl, D., Lee, Thomas, H.  
1996; 31: 1703-1714
- **A 1.5V, 1.5 GHz CMOS Low-Noise Amplifier**  
Shaeffer, D., Lee, T.  
1996
- **A Physical Model for Spiral Inductors on Silicon** *International Electron Devices Meeting Technical Digest, San Francisco, CA*  
Yue, P., Ryu, C., Lau, J., Lee, T., Wong, S.  
1996
- **A 1.5V, 1.5 GHz CMOS Low-Noise Amplifier**  
Shaeffer, Lee, T.  
1996
- **A 160MHz 32b 0.5W CMOS RISC Microprocessor**  
Montanaro, J., Witek, R., Anne, K., Black, A., Cooper, E., Dobberpuhl, D., Lee, Thomas, H.  
1996
- **A 2.5V Delay-Locked Loop for an 18Mbit, 500MByte/sec DRAM** *IEEE Journal of Solid-State Circuits*  
Lee, T., Donnelly, K., Ho, J., Zerbe, J., Johnson, M., Ishawa, T.  
1994; 29: 1491-1496
- **A 2.5V Delay-Locked Loop for an 18Mbit, 500MByte/sec DRAM**  
Lee, T., Donnelly, K., Ho, J., Zerbe, J., Johnson, M., Ishikawa, T.  
1994
- **A 500-Megabyte/s Data-Rate 4.5M DRAM** *IEEE Journal of Solid-State Circuits*  
Kushiyama, N., Ohsha, S., Stark, D., Noji, H., Sakurai, K., Takase, S., Lee, Thomas, H.  
1993; 28: 490-498
- **PLL Design for a 500MByte/sec Interface**  
Horowitz, M., Chan, A., Cobrunson, J., Gasbarro, J., Lee, T., Leung, W.  
1993
- **A 155MHz Clock Recovery Delay- and Phase-Locked Loop** *IEEE Journal of Solid-State Circuits*  
Lee, T., Bulzacchelli, J.

1992; 27: 1736-1746

- **A 155MHz Clock Recovery Delay- and Phase-Locked Loop**

Lee, T., Bulzacchelli, J.

1992

- **Circuits, Analog” and “Circuits, Digital** *articles for Encyclopedia of Applied Physics*

Lee, T.

VCH Publishers.1992: 1