

Alex Z. Kattamis, Ph.D., P.E., CFEI
Managing Engineer

Professional Profile

Dr. Alex Kattamis is a Managing Engineer in Exponent's Electrical Engineering and Computer Science practice. Dr. Kattamis' expertise is in the field of semiconductor devices and materials and includes thin-film transistors (TFTs), circuit design, and fabrication. He also has significant experience in thin-film mechanics, especially involving processing devices on polymer and metal foil substrates. His fabrication experience includes processing by plasma-enhanced chemical vapor deposition, reactive-ion etching, sputter deposition, and photolithography. Along with this, he has experience in analog electronics and firmware for current sensing and protection applications.

Dr. Kattamis received his M.A. and Ph.D. in Electrical Engineering (EE) at Princeton University where he worked in the Electronic Materials and Devices branch of the EE department. His Ph.D. research focused on flexible large-area electronics (macroelectronics), including the design and fabrication of TFT backplanes for organic light-emitting displays and reflective electrophoretic displays on flexible metal foils and polymer substrates. While at Princeton University, Dr. Kattamis also assumed teaching responsibilities. He was an Assistant in Instruction (AI) for three courses: microfabrication, digital electronics, and basic circuits. As a McGraw Fellow he also had the opportunity to mentor new AIs in the techniques of "active-learning." Dr. Kattamis currently holds an academic position as an Adjunct Assistant Professor in the Department Physics at the Polytechnic Institute of NYU.

Prior to his Ph.D., Dr. Kattamis worked and interned at General Electric Industrial Systems, where he was involved in the design and implementation of electronic trip units and current sensing systems for industrial metering and switchgear applications. This included analog electronics design, modeling, and firmware coding for product prototyping. He also developed expertise in current transformers and switching current power supplies, work for which he was awarded the Student Intern/Co-op Contribution Award. During his time at the University of Connecticut, where he earned a B.S.E, he worked on a number of electronics device design projects funded by the National Science Foundation for Biomedical applications.

Academic Credentials and Professional Honors

Ph.D., Electrical Engineering, Princeton University, 2007
M.A., Electrical Engineering, Princeton University, 2004
B.S.E., Electrical Engineering, University of Connecticut (*magna cum laude*), 2002

Princeton Plasma Physics Fellowship Recipient; Tau Beta Pi, Eta Kappa Nu; McGraw Graduate Fellow; General Electric Student Intern Award Recipient; Citigroup Scholarship Recipient

Licenses and Certifications

Licensed Professional Engineer, New York, #090343
Certified Fire and Explosion Investigator (CFEI)

Languages

Greek, French

Publications

D'Andrade B, Kattamis AZ, Murphy PF, McNulty J, Souri S. Arcing enabled by tin whiskers. IEEE: Reliability Society 2010 Annual Technical Report, 2010.

D'Andrade B, Kattamis AZ. Flexible active-matrix organic light emitting displays. Silicon Valley Engineering Council Journal 2009; 1:18–21.

Hekmatshoar B, Cherenack K, Kattamis AZ, Long K, Wagner S, Sturm JC. Highly stable amorphous-silicon thin-film transistors on clear plastic. Applied Physics Letters 2008; 93:032103–1–3.

Hekmatshoar B, Cherenack K, Long K, Kattamis AZ, Wagner S, Sturm JC. AMOLED reliability with a-Si TFT's in normal vs. inverted TFT/OLED integration scheme. 66th Dev Res Conf 2008; 243–244.

Kattamis AZ, Cherenack KH, Cheng I-C, Long K, Sturm JC, Wagner S. Fracture mechanisms of SiN_x thin-films on compliant substrates. Materials Research Society Symposium Proceedings 2008; 1078-M14-02.

Hekmatshoar B, Kattamis AZ, Cherenack K, Wagner S, Sturm JC. A novel TFT-OLED integration for OLED-independent pixel programming in amorphous-Si AMOLED pixels. Journal of the Society for Information Display 2008; 16.

Hekmatshoar B., Kattamis AZ, Cherenack KH, Long K, Chen J-Z, Wagner S, Sturm JC, Rajan K, Hack M. Reliability of active-matrix organic light-emitting-diode arrays with amorphous silicon thin-film transistor backplanes on clear plastic. IEEE Electron Device Letters 2008; 29.

Yongtaek H, Chung S, Kattamis A, Cheng I-C, Wagner S. Technical issues of stainless steel foil substrates for OLED display applications. Proceedings, SPIE 2007; 6655:66550N.

Cherenack KH, Kattamis AZ, Hekmatshoar B, Sturm JC, Wagner S. Amorphous-silicon thin-film transistors fabricated at 300C on a free-standing foil substrate of clear plastic. IEEE Electron Device Letters 2007; 28:1004–1006.

Carcia PF, McLean RS, Reilly MH, Crawford MK, Blanchard EN, Kattamis AZ, Wagner S. A comparison of zinc oxide thin-film transistors on silicon oxide and silicon nitride gate dielectrics. *Journal of Applied Physics* 2007; 102:074512–074519.

Kattamis AZ, Cherenack KH, Hekmatshoar B, Cheng I-C, Gleskova H, Sturm JC, Wagner S. Effect of SiN_x gate dielectric deposition power and temperature on a-Si:H TFT stability. *IEEE Electron Device Letters* 2007; 28:606–608.

Long K, Kattamis AK, Cheng I-C, Gleskova H, Wagner S, Sturm JC. Amorphous-silicon thin-film transistors made at 280°C on clear-plastic substrates by interfacial stress engineering. *Journal of the Society for Information Display* 2007; 15:167–176.

Kattamis AZ, Giebink N, Cheng I-C, Hong Y, Cannella V, Forrest SR, Wagner S. Active-matrix organic light emitting display employing two thin film transistor a-Si:H Pixels on flexible stainless steel foil. *Journal of the Society for Information Display* 2006; 15:433–437.

Kattamis AZ, Cheng I-C, Long K, Hekmatshoar B, Cherenack K, Wagner, S, Sturm JC, Venugopal S, Loy DE, O'Rourke SM, Allee DR. Amorphous silicon thin film transistor backplanes deposited at 200°C on clear plastic. *IEEE Journal of Display Technology* 2006; 2:304–308.

Kattamis AZ, Giebink N, Cheng I-C, Hong Y, Cannella V, Forrest SR, Wagner S. AMOLED backplanes of amorphous silicon on steel foils. *Proceedings, Inter Disp Res Conf SID* 2006; 9.3.

Kattamis AZ, Cheng I-C, Long K, Forrest SR, Sturm JC, Wagner S. Amorphous silicon 2-TFT pixel circuits on stainless steel foils. *Materials Research Society Symposium Proceedings* 2006; 936E:0910-A16-03-L09-03.

Long K, Kattamis AZ, Cheng I-C, Sturm JC, Wagner S, Stevenson M, Yu G, O'Reagan M. Active-matrix amorphous-silicon TFTs arrays at 180°C on clear plastic and glass substrates for organic light-emitting displays. *IEEE Transactions on Electron Devices* 2006; 53:1789–1796.

Cheng I-C, Kattamis AZ, Long K, Sturm JC, Wagner S. Self-aligned amorphous-silicon thin-film transistors on clear plastic substrates. *IEEE Electron Device Letters* 2006; 27:166–168.

Long K, Kattamis AZ, Cheng I-C, Gleskova H, Wagner S, Sturm JC. Stability of amorphous-silicon thin-film transistors deposited on clear plastic substrates at 250°C to 280°C. *IEEE Electron Device Letters* 2006; 27:111–113.

Kattamis AZ, Holmes RJ, Cheng I-C, Long K, Forrest SR, Sturm JC, Wagner S. High Mobility Nanocrystalline Silicon Transistors on Clear Plastic Substrates. *IEEE Electron Device Letters* 2006; 27:49–51.

Kattamis AZ, Cheng I-C, Sturm JC, Wagner S. Nanocrystalline silicon thin film transistors on optically clear polymer foil substrates. Proceedings, Materials Research Society Symposium Proceedings 2005; 870:H2.7.1–6.

Cheng I-C, Kattamis AZ, Long K, Sturm JC, Wagner S. Stress control for overlay registration in a-Si:H TFTs on flexible organic-polymer-foil substrate. Journal of the Society for Information Display 2005; 13:563–568.

Kattamis AZ, Cheng I-C, Allen S, Wagner S. Hydrogen in ultralow temperature SiO₂ for nanocrystalline silicon thin film transistors. Proceedings, Materials Research Society Symposium Proceedings 2004; 814:I10.14.1–6.

Published Abstracts of Presentations

D'Andrade B, Kattamis AZ. Flexible solid state lighting. Optics and Photonics for Advanced Energy Technology, OSA Technical Digest WB4, 2009.

Kattamis AZ, Cherenack K, Hekmatshoar B, Cheng I-C, Sturm JC, Wagner S. Amorphous silicon thin-film transistor backplanes fabricated on a clear plastic substrate at 300°C. 22nd International Conference on Amorphous and Nanocrystalline Semiconductors, 2007.

Kattamis AZ, Cheng I-C, Long K, Cherenack K, Hekmatshoar B, Sturm JC, Wagner S. Amorphous silicon thin-film transistor backplanes deposited at high temperature on clear plastic for electrophoretic displays. Electronic Materials Conference, 2007.

Kattamis AZ, Cheng I-C, Long K, Sturm JC, Wagner S. Effect of SiN_x gate dielectric deposition power on the electrical stability of a-Si:H TFTs. Materials Research Society Spring Meeting, 2007.

Kattamis AZ, Hekmatshoar B, Cherenack K, Wagner S, Sturm JC, Venugopal S, Loy DE, O'Rourke SM, Allee DR. Amorphous silicon thin-film transistor backplanes processed at high temperatures on clear plastic for flexible electrophoretic displays. 6th Annual Flexible Display and Microelectronics Conference of USDC, 2007.

Kattamis AZ, Cheng I-C, Long K, Sturm JC, Wagner S. Built-in strain in silicon nitride films on polymer foils. Electronic Materials Conference, 2006.

Kattamis AZ, Giebink N, Cheng I-C, , Hong Y, Cannella V, Forrest SR, Wagner S. AMOLED backplanes of amorphous silicon on steel foils. International Display Research Conference SID 9.3, 2006.

Kattamis AZ, Cheng I-C, Long K, Forrest SR, Sturm JC, Wagner S. Amorphous silicon 2-TFT pixel circuits on stainless steel foils. Materials Research Society Spring Meeting, 2006.

Kattamis AZ, Holmes RJ, Cheng I-C, Long K, Forrest SR, Sturm JC, Wagner S. Nanocrystalline silicon TFTs on Clear Plastic Foil for Flexible OLED Displays. 21st International Conference on Amorphous and Nanocrystalline Semiconductors, 2005.

Kattamis AZ, Cheng I-C, Long K, Sturm JC, Wagner S. Dimensionally stable processing of a-Si TFTs on polymer substrates. Electronic Materials Conference, 2005.

Kattamis AZ, Cheng I-C, Sturm JC, Wagner S. Nanocrystalline silicon thin film transistors on optically clear polymer foil substrates. Materials Research Society Spring Meeting, 2005.

Kattamis AZ, Cheng I-C, Allen S, Wagner S. Hydrogen in ultralow temperature SiO₂ for nanocrystalline silicon thin film transistors. Materials Research Society Spring Meeting, 2004.

Prior Experience

Research Assistant, Princeton University, 2002–2007

Design Engineer, General Electric Industrial Systems, Summer 2001, 2002

Failure Analysis

- Root cause analysis of medical device failures
- Root cause analysis of lighting device failures
- Root cause analysis of failures in power strips used in data centers
- Hazard analysis for lighting devices
- Root cause analysis for motor run capacitor failures

Flexible Electronic Circuits

- Flexible aluminum substrate characterization
- Amorphous silicon thin-film transistor deposition
- Aluminum substrate passivation and coating for thin-film processing

Hard Disk Drives

- Patent and trade secret investigations relating to hard disk drive intellectual property
- Infringement analysis of accused hard disk drives products
- Prior art and validity analysis of patents related to hard disk drive patents

Light Emitting Devices

- Patent investigations relating to LED and laser diode intellectual property
- Reverse engineering focusing on device processing and characterization
- Infringement analysis of accused LEDs and laser diodes
- Prior art and validity analysis of patents related LEDs and laser diodes

Semiconductor Devices and Materials

- Patent investigations relating to semiconductor devices
- Reverse engineering focusing on packaging, processing and design of memories and other semiconductor devices
- Infringement analysis of accused memories and other semiconductor devices
- Prior art and validity analysis of patents related to memories and other semiconductor devices

Image Processing Software

- Reverse engineering focusing on image processing software and algorithms
- Infringement analysis of accused image processing products
- Prior art and validity analysis of patents related to image processing patents

Computer Networks

- Reverse engineering focusing on computer networks, including networks for providing financial services
- Infringement analysis of accused computer networking products

Fire Investigations

- Cause and origin of fires relating to electrical equipment and consumer electronics

Academic Appointments

- Adjunct Assistant Professor, Department of Physics, Polytechnic Institute of NYU

Professional Affiliations

- Institute of Electrical and Electronic Engineers (member)
- Society for Information Display (member)
- Materials Research Society (member)
- ASM International