

Eric J. Carleton, Ph.D.
Senior Associate

Professional Profile

Dr. Carleton's areas of specialization include development and optimization of semiconductor devices and associated back-end processes (opto-electronics, MEMS), electrochemical deposition, thin film and bulk materials characterization and testing, optical modeling (devices, packages, simple modules), and multi-physics FEA modeling (devices, packages, process optimization). He is also experienced in electrical breakdown characterization of ceramics, ceramic synthesis (thin-film, thick-film, bulk), and synthesis, characterization, and structure/property elucidation of glass (hermetic sealing glasses, transuranic waste material glasses, monolithic graded index glasses). Dr. Carleton has intellectual property experience in the optoelectronics field, including the drafting of Opinion Letters and Freedom to Operate Summaries.

Prior to joining Exponent, Dr. Carleton was a founding member of a high-brightness LED start-up company. There he optimized a laser separation process, created a wet-chemical die singulation process, established a void-free bonding method utilizing non-standard machinery, and designed and optimized a novel process and cell for thick, low-stress electrodeposited foils. Additionally, he helped secure funding by demonstrating superior modeled device/package performance and non-infringement.

Academic Credentials and Professional Honors

Ph.D., Materials Science and Engineering, University of California, Berkeley, 2008
M.S., Ceramic Engineering, University of Missouri, Rolla (summa cum laude), 2000
B.S., Ceramic Engineering, University of Missouri, Rolla (honors, summa cum laude), 1998

National Defense Science and Engineering Graduate (NDSEG) Fellow

National Science Foundation (NSF) Graduate Fellow

Phi Kappa Phi

Tau Beta Pi

Phi Eta Sigma

Keramos

Publications

Roundy S, Leland ES, Baker J, Carleton EJ, Reilly E, Lai E, Otis B, Rabaey J, Wright P, Sundararajan V. Improving power output for vibration-based energy scavengers. *IEEE Pervasive Comp* 2005; 4:28–36.

Reilly EK, Carleton EJ, Wright PK. Vibrational energy scavenging via thin film piezoelectric ceramics. *TMS Annual Meeting Conference Proceedings*, 2004.

Tsakalagos L, Sands T, Carleton EJ, Yu KM. Modification of (Pb,La)(Zr,Ti)O₃ thin films during pulsed laser liftoff from MgO substrates. *J Appl Phys* 2003; 93:4047–4052.

Carleton EJ, Huebner W. Surface switching characteristics of variable permittivity dielectrics. *IEEE Trans DEI* 2002; 9:253–262.

Book Chapters

Roundy S, Sundararajan V, Baker J, Carleton EJ, Reilly E, Otis B, Rabaey J, Wright P. Energy scavenging in support of ambient intelligence: Techniques, challenges, and future directions. pp. 265–285. In: *AmIware: Hardware Technology Drivers of Ambient Intelligence*. Mukherjee E (ed), 2006.

Presentations

Carleton EJ, Sands T. Polymer/epitaxial PLZT thin film composites by excimer laser lift-off. *Materials Research Society Spring Meeting*, 2003.

Carleton E, Tsakalagos L, Salleo A, Wong WS, Sands T, Caton P, White RM. Excimer laser liftoff: An alternative integration scheme for fabricating Pb(Zr,Ti)O₃-based MEMS. *Materials Research Society Fall Meeting*, 2000.

Carleton E, Huebner W. Optimization of Surface Discharge Switching of Ceramic Blumleins. *American Ceramic Society National Conference*, 2000.

Carleton E, Huebner W. Intensified ferroelectric emission current density due to active volume enhancement. *American Ceramic Society National Conference*, 2000.

Carleton E, Huebner W, Zhang W. Characterization of gap discharge behavior across dielectric substrates. *American Ceramic Society National Conference*, 1999.

Carleton E, Brow R, Sidebottom D. Properties, structure, and compositional trends of silver vanadotellurite glasses. *American Ceramic Society National Conference*, 1998.

Prior Experience

Chief Research Engineer, Verticle Inc., 2010
Technical Staff, Verticle Inc., 2008–2010
Independent Technical Consultant, 1999–2010
Research Assistant, Sandia National Laboratory, 1995–1999
Research Assistant, Lightpath Technologies Inc., 1996

Professional Affiliations

Materials Research Society—MRS
American Ceramic Society—ACS