

JOHN CROFTON

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WORK EXPERIENCE

2004-present: Professor of Engineering Physics, Murray State University, KY & Associate Professor of Electrical Engineering, The University of Kentucky.
1999-2004: Associate Professor of Engineering Physics, Murray State University, KY & Associate Professor of Electrical Engineering, The University of Kentucky.
1997-1999: Assistant Professor of Electrical Engineering, University of Kentucky. Jointly appointed with Murray State University.
1994-1999: Assistant Professor of Engineering Physics, Murray State University, KY.
1994: Senior Engineer, Westinghouse Science and Technology Center, Pittsburgh, PA.

EDUCATION

B.S., M.S., Ph.D., Physics

B.E.E., Electrical Engineering

PROFESSIONAL MEMBERSHIPS

Member, Institute of Electrical and Electronics Engineers (IEEE)

Member, Aircraft Owners and Pilots Association (AOPA)

FUNDED CONTRACTS AND GRANTS

"A Low-Power, Long-Lifetime Water Purification System," Kentucky Space Grant Consortium, **\$14,972**, 2006-2007.

"Development of a Microelectromechanical Sensor to Detect Biological Threat Agents", Kentucky Science and Engineering Foundation Homeland Security, **\$28,886**, 2005-2006.

"Ohmic Contacts to P-Type GaN", Sandia National Labs, 8/5/02 – 09/19/03, **\$33,000**

"Contact Metallization and Packaging Technology...", Wright Patterson Air Force Base funding Auburn, Penn State, Murray State, and CREE Research. Total 4 year award is **\$1,748,386**

"SiC Schottky Photodiodes," Kentucky NSF EPSCoR, 6/1/99 – 7/31/00, **\$12,000**

"Contacts to P-SiC", TDI, Inc., subcontract from Phase II SBIR, 6/1/00- 6/30/01, **\$20,000**

"Ohmic Contacts to P-Type SiC," Office of Naval Research, 6/1/99-8/31/00, **\$42,010**

"Contacts to P-SiC", TDI, Inc., subcontract from Phase I SBIR, 5/1/99- 10/31/99, **\$8,000**

"SiC Contacts," NASA/Auburn University, 11/1/94 -10/31/99, **\$181,766**

"SiC Visible Light Photodiodes," Kentucky NSF EPSCoR, 6/1/98-5/31/99, **\$12,000**

"Reactive Ion Etching of SiC," Kentucky Space Grant Consortium, 8/1/97 - 7/31/98, **\$4,860**

"Electrical and Physical Characterization of High Temperature Schottky Contacts to N-Type SiC," Kentucky Space Grant Consortium, 8/1/96 - 7/31/97, **\$9,986**

"An Investigation of Ohmic Contacts in P-Type SiC Devices by RBS," Kentucky Space Grant Consortium, 9/1/95 - 8/1/96, **\$9,989**

SELECTED PROFESSIONAL PRESENTATIONS

“The Use of Elluminate LIVE!® Distance Learning Software in Engineering Education”, Presented at the American Society for Engineering Education Conference, 2007.

“Ohmic Contact to P-Type Epitaxial and Implanted 4H-SiC”, J. Crofton, J.R. Williams, A.V. Adedeji, J.D. Scofield, S. Dhar, L.C. Feldman, and M.J. Bozack, Presented at the International Conference on Silicon Carbide and Related Materials, Pittsburgh, PA, 2005.

“Ohmic Contacts to SiC and GaN” presented at Memorial University, St. John’s, Newfoundland, Canada, July, 2004.

“Electrical and Morphological Study of a 70/30 Al-Ti Ohmic Contact to SiC”, presented at the 6th International High Temperature Electronics Conference, Albuquerque, NM, June 2002.

“Al-Ti P-Type Ohmic Contacts to SiC”, presented at 5th International High Temperature Electronics Conference, Albuquerque, NM, June 2000.

“High Temperature Ohmic Contacts to P-Type SiC,” presented at the 4th International High Temperature Electronics Conference, Albuquerque, NM, June 1998.

“SiC Contacts,” presented at Universitat Erlangen-Nurnberg, Germany, July 1993.

PUBLICATIONS

“The Use of Elluminate LIVE!® Distance Learning Software in Engineering Education”, Proceedings of the American Society for Engineering Education Conference, 2007.

“Calculations and Measurements of Contact Resistance of Semi-Transparent Ni/Pd Contacts to p-GaN”, K. Bogart, J. Crofton, Journal of Electronic Materials, Vol. 35, No. 4, 2006.

“Ohmic Contact to P-Type Epitaxial and Implanted 4H-SiC”, J. Crofton, J.R. Williams, A.V. Adedeji, J.D. Scofield, S. Dhar, L.C. Feldman, and M.J. Bozack, Proceedings of the ICSCRM, Pittsburgh, PA, 2005.

“Report on Ohmic Contacts to p-type GaN”, Internal Publication Submitted to Sandia National Laboratories, August 2003.

“Finding the Optimum Al-Ti Alloy Composition for Use as an Ohmic Contact to P-Type SiC”, J. Crofton, S. E. Mohny, J.R. Williams, T. Isaacs-Smith, Solid State Electronics, Volume 46, No. 1, pp 109-113, 2002.

“Morphological Study of the Al-Ti Ohmic Contact to p-Type SiC”, S.E. Mohny, B.A. Hull, J.Y. Lin, J. Crofton, Solid State Electronics, Volume 46, pp 689-693, 2002.

PUBLICATIONS CONTINUED

"Electrical and Morphological Study of a 70/30 Al-Ti Ohmic Contact to SiC", J. Crofton, S.E. Mohny, B.A. Hull, J.R. Williams, T. Isaacs-Smith, A. Syrkin, Proceedings of the 6th International High Temperature Electronics Conference, June 2002.

"Liquid Phase Epitaxial Growth of Heavily Doped Al p-type Contact Layers for SiC Devices and Resulting Ohmic Contacts", A. Syrkin, V. Dmitriev, O. Kovalenkov, D. Bauman, J. Crofton. Proceedings of the ICSCRM Conference, Tsukuba, Japan, 2001.

"Liquid phase epitaxy of p⁺-4H-SiC layers and resulted low resistivity Ohmic contacts", A. Syrkin, A. Morozov, V. Dmitriev, J. Crofton. Proceedings of the Electronic Materials Conference, Notre Dame University, June, 2001.

"Engineering the Al-Ti/p-SiC Ohmic Contact for Improved Performance", J.Y. Lin, S.E. Mohny, M. Smalley, J. Crofton, J.R. Williams, T. Isaacs-Smith, Materials Research Society Symposium, Vol. 640, 2001.

"Design Considerations in Engineering Physics: Integrating Design Across the Curriculum", S.H. Cobb, J. Crofton, S.R. Hickman, W.E. Maddox, T.D. Thiede, Proceedings of the ASEE Conference, June 2000.

"Al-Ti Ohmic Contacts to P-SiC", J. Crofton, S.E. Mohny, J. Lin, J.R. Williams, T. Isaacs-Smith, Proceedings of the 5th International High Temperature Electronics Conference, June 2000.

"Searching for Device Processing Compatible Ohmic Contacts to P-Type 4H-SiC", Y.L. Feng, F. Yan, K. Tone, J.H. Zhao, J. Crofton, Proceedings of the International Conf. on SiC 1999.

"Low Resistance Ohmic Contacts to N-Type SiC Using Niobium", T.N. Oder, J.R. Williams, K.W. Bryant, M.J. Bozack, J. Crofton, Proceedings of the International Conference on SiC 1999.

"High Temperature Ohmic Contacts to P-Type SiC," J. Crofton, L. Beyer, T. Hogue, R.R. Siergiej, S. Mani, J.B. Casady, T.N. Oder, J.R. Williams, E.D. Luckowski, T. Isaacs-Smith, V.R. Iyer, S.E. Mohny. Proceedings of the 4th International High Temperature Electronics Conference, Albuquerque, NM, June 1998.

"Improved Ohmic Contact to N-Type 4H and 6H-SiC Using Nichrome," E.D. Luckowski, J.M. DeLucca, J.R. Williams, S.E. Mohny, M.J. Bozack, T. Isaacs-Smith, J. Crofton. Journal of Electronic Materials, Vol. 27, No. 4, pg. 330, 1998.

"High Temperature Stability of Chromium Boride Ohmic Contacts to P-Type 6H-SiC," T. N. Oder, J.R. Williams, M.J. Bozack, S.E. Mohny, J. Crofton. Published in "III-V Nitrides and SiC," a special issue of the Journal of Electronic Materials.

PUBLICATIONS CONTINUED

“Refractory Metal Boride Ohmic Contacts to P-Type 6H-SiC,” T.N. Oder, J.R. Williams, S.E. Mohney, J. Crofton. *Journal of Electronic Materials*, Vol. 27, No. 1, 12, 1998.

“Titanium and Aluminum-Titanium Ohmic Contacts to P-Type SiC,” J. Crofton, L. Beyer, J.R. Williams, E.D. Luckowski, S.E. Mohney, J.M. DeLuca. *Solid State Electronics*, Vol. 41, No. 11, 1725, 1997.

“The Physics of Ohmic Contacts,” J. Crofton, L.M. Porter, J.R. Williams. Published in *“A Review of Fundamental Questions and Applications of SiC to Current Device Technology,”* *Physica Status Solidi (b)*, Vol. 202, No. 1, 581, 1997. INVITED PAPER.

“Reverse Leakage Current Calculations for SiC Schottky Contacts,” J. Crofton, S. Sriram. *IEEE Transactions on Electron Devices*, Vol. 43, No. 12, 2305, December 1996.

“Improved Nickel Silicide Ohmic Contacts to N-Type 4H and 6H-SiC Using Nichrome,” E.D. Luckowski, J.R. Williams, M.J. Bozack, T. Isaacs-Smith, J. Crofton. *Proceedings of the Materials Research Society Spring Meeting, San Francisco, April 1996.*

“Specific Contact Resistance as a Function of Doping for N-Type 6H-SiC,” J. Crofton, E.D. Luckowski, J.R. Williams, T. Isaacs-Smith, M.J. Bozack, R. Siergie. *Proceedings of the 6th International Conference on Silicon Carbide and Related Materials, Japan, 1995.*

“Fabrication Procedures and Characterization of 6H-SiC MESFETs for Use in High Temperature Electronics,” J.B. Casady, E.D. Luckowski, R.W. Johnson, J. Crofton, J.R.

Williams. *Proceedings of the 45th Electronic Components and Technology Conference, Las Vegas, NV, May 1995.*

“A High Temperature Ohmic Contact to SiC Using Ni,” J. Crofton, P.G. McMullin, J.R. Williams, M.J. Bozack. *Journal of Applied Physics*, **77**, 3, February 1995.

“High Temperature Ohmic and Schottky Contacts to N-Type 6H-SiC Using Ni,” J. R. Williams, M.J. Bozack, T. Isaacs-Smith, E.D. Luckowski, C. Meadows, J. Crofton, P.G. McMullin. *Symposia on Space Nuclear Power Systems, Albuquerque, NM, January 1995.*

“A TiW High Temperature Ohmic Contact to N-Type 6H-SiC,” J. Crofton, J.R. Williams, M.J. Bozack, P.A. Barnes. *Amorphous and Crystalline SiC V*, Springer-Verlag, 1994.

“Non-Alloyed Contacts to P-GaAs,” P.A. Barnes, J. Park, J. Crofton. *Proceedings of Optically Activated Switching III, Los Angeles, CA, January 1993.*

“Contact Resistance Measurements on P-Type 6H-SiC,” J. Crofton, P.A. Barnes, J.R. Williams, J. Edmond. *Applied Physics Letters*, 62 (4), January 1993.

PUBLICATIONS CONTINUED

“Quantum Mechanical Tunneling in an Ohmic Contact,” J. Crofton, P.A. Barnes, M.J. Bozack. American Journal of Physics, **60**, 6, June 1992.

“Metallization Studies on Epitaxial 6H-SiC,” J. Crofton, J.M. Ferrero, P.A. Barnes, J.R. Williams, M. J. Bozack, C.C. Tin, C.D. Ellis, J.A. Spitznagel, P.G. McMullin. Amorphous and Crystalline SiC IV, Springer-Verlag, 1992.

“Oxidation Studies for 6H-SiC,” C.S. Patuwathavithane, J. Crofton, J.R. Williams, C.C. Tin, Z.C. Feng, M.J. Bozack, P.A. Barnes. Amorphous and Crystalline SiC IV, Springer-Verlag, 1992.

“A Comparison of One, Two, and Three Band Calculations of Contact Resistance Using the Wentzel-Kramers-Brillouin Approximation and a Numerical Solution to the Schrodinger Equation,” J. Crofton, P.A. Barnes. Journal of Applied Physics, **69**, 11, 1991.