

Curriculum Vitae of  
Dr. Francesco Iannuzzo, Ph.D.  
Professor of Reliable Power Electronics

Date: February 13, 2020



♣ **Personal and Contact Details**

Date of birth: [redacted] ♦ Place of birth: [redacted] ♦ Citizenship: [redacted] ♦ Country of residence: [redacted]  
Office: [redacted] ♦ email: [redacted]

♣ **Education**

M.Sc. Degree in Electronic Engineering, cum laude, from the University of Naples, Italy, March 1997 ♦ Ph.D. in Electronics and Information Technology from the University of Naples, Italy, March 2002.

♣ **Career**

Professor in Reliable Power Electronics at Aalborg University, Denmark, from 2014 to present ♦ Visiting professor at Huazhong University of Science and Technology, Wuhan, China, in 2019 ♦ Visiting Professor at Zhejiang University, China, in 2018 ♦ Visiting Professor at Aalborg University, Denmark, 2013 (three months) ♦ Associate Professor at the University of Cassino and southern Lazio, Italy, 2012 to 2014 ♦ Aggregate Professor at the University of Cassino and southern Lazio, Italy, 2006 to 2012 ♦ Researcher at the University of Cassino and southern Lazio, Italy, 2000 to 2006

♣ **Research topics**

Reliability and non-destructive characterization of power devices in normal and extreme operating conditions (*overload, short circuit, over temperature*) ♦ Lumped-charge simulation models for power electronic devices ♦ Simulation and optimization of new driving topologies for reliability ♦ Condition monitoring ♦ Impact of cosmic particles of power devices and related modeling ♦ Reliability of wide-bandgap power devices (WBGs), modeling and characterization

♣ **Membership of scientific communities and services**

IEEE (Institute of Electrical and Electronics Engineers) senior member since 2012 ♦ Co-founder of the Italian IEEE Electron Device Society chapter ♦ Associated editor of IEEE Transactions on Industry Applications, IEEE Journal of Emerging and Selected Topics in Power Electronics, IEEE Open Journal on Power Electronics, EPE Journal and Elsevier Microelectronics Reliability ♦ General Chair of ESREF 2018, the 29<sup>th</sup> European Symposium on Reliability of Electron devices, Failure physics and analysis ([www.esref2018conf.org](http://www.esref2018conf.org))

♣ **Scientific contributions and awards**

Total publications: 222 - Journals/conferences/patents/book chapters: 108/107/4/3 ♦ Total citations (Publons/ Scopus/ Google Scholar): 999/1481/1930 ♦ h-index (Publons/ Scopus/ Google Scholar): 15/19/21 ♦ Invited as tutorial lecturer on reliability to first conferences, i.e. ECCE USA 2019, APEC 2016, 2017, 2018 and 2019, PCIM 2016, 2017, 2018 and 2019, ISPSD 2017, EPE 2015, 2018 and 2019, ECPE Course on thermal management, 2019 ♦ Recipient of a number of best paper awards at first international conferences. W. Portnoy Award 2017 of the IEEE Industry Application Society. Awarded guest professor 2020 – 2023 at Huazhong University of Science and Technology, Wuhan, China

♣ **Recent applications and running projects**

2019 – (co-applicant) "ELMAC: Electronic Systems Manufactured for Climate", Danmarks Innovationsfond. Total amount/Aalborg University's part: 32.000.000 DKK / 4.500.000 DKK (running)

2016 – (co-applicant) "DfR<sup>2</sup> Tools for Reliable and Robust Power Electronics in Energy Systems" (DfR<sup>2</sup> - APETT), Danmarks Innovationsfond, Aalborg university: 48.500.000 DKK (running)

2019 – (co-applicant) "X-Power - Power Electronics Reliability Test Facilities", supported by the Danish Agency for Science and Higher Education, Aalborg University: 62.000.000 DKK (running)

2017-2019 – (main responsible) A number of consultancy projects with European companies, Aalborg University, in total: +2.000.000 DKK (running)

♣ **Teaching activities**

Lecturer of M.Sc. courses in "Reliability theory" and "Modern power devices and their models", Aalborg University ♦ Organizer and lecturer of 3 yearly industrial/academic Ph.D. courses on reliability or power devices, Aalborg University.

## Dr. Francesco Iannuzzo, Ph.D.

Professor of Reliable Power Electronics

### Selected publications

Date: February 13, 2020

- 1 Rui Wu; Blaabjerg, F.; Huai Wang; Liserre, M.; Iannuzzo, F., "Catastrophic failure and fault-tolerant design of IGBT power electronic converters - an overview," *Industrial Electronics Society, IECON 2013 - 39th Annual Conference of the IEEE*, vol., no., pp.507,513, 10-13 Nov. 2013. doi: 10.1109/IECON.2013.6699187
- 2 Sintamarean, N.; Blaabjerg, F.; Wang, H.; Iannuzzo, F.; de Place Rikken, P., "Reliability Oriented Design Tool For the New Generation of Grid Connected PV-Inverters," *Power Electronics, IEEE Transactions on*, vol.30, no.5, pp.2635,2644, May 2015. Doi: 10.1109/TPEL.2014.2361918
- 3 N. Baker, S. Munk-Nielsen, F. Iannuzzo, L. Dupont and M. Liserre, "Experimental evaluation of IGBT junction temperature measurement via peak gate current," *Power Electronics and Applications (EPE'15 ECCE-Europe), 2015 17th European Conference on*, Geneva, 2015, pp. 1-11. doi: 10.1109/EPE.2015.7311733
- 4 P. D. Reigosa, F. Iannuzzo, H. Luo and F. Blaabjerg, "A Short-Circuit Safe Operation Area Identification Criterion for SiC MOSFET Power Modules," in *IEEE Transactions on Industry Applications*, vol. 53, no. 3, pp. 2880-2887, May-June 2017. doi: 10.1109/TIA.2016.2628895
- 5 Baker, N.; Munk-Nielsen, S.; Liserre, M.; Iannuzzo, F., "Online junction temperature measurement via internal gate resistance during turn-on," *Power Electronics and Applications (EPE'14-ECCE Europe), 2014 16th European Conference on*, vol., no., pp.1,10, 26-28 Aug. 2014. doi: 10.1109/EPE.2014.6911024
- 6 U.M. Choi, F. Blaabjerg, F. Iannuzzo, S. Jørgensen, Junction temperature estimation method for a 600 V, 30A IGBT module during converter operation, *Microelectronics Reliability*, Volume 55, Issues 9–10, August–September 2015, Pages 2022-2026, ISSN 0026-2714, DOI: 10.1016/j.microrel.2015.06.146.
- 7 Iannuzzo, F.; Abbate, C.; Busatto, G., "Instabilities in Silicon Power Devices: A Review of Failure Mechanisms in Modern Power Devices," *Industrial Electronics Magazine, IEEE*, vol.8, no.3, pp.28,39, Sept. 2014. doi: 10.1109/MIE.2014.2305758
- 8 Yue Gao, Shuhei Takata, Chuantong Chen, Shijo Nagao, Katsuaki Suganuma, Amir Sajjad Bahman, Francesco Iannuzzo, Reliability analysis of sintered Cu joints for SiC power devices under thermal shock condition, *Microelectronics Reliability*, 2019, 113456, ISSN 0026-2714. <https://doi.org/10.1016/j.microrel.2019.113456>.
- 9 Maogong Jiang, Guicui Fu, Martin Bendix Fogsgaard, Amir Sajjad Bahman, Yongheng Yang, Francesco Iannuzzo, Wear-out evolution analysis of multiple-bond-wires power modules based on thermo-electro-mechanical FEM simulation, *Microelectronics Reliability*, 2019, 113472, ISSN 0026-2714. <https://doi.org/10.1016/j.microrel.2019.113472>.
- 10 H. Luo, F. Iannuzzo and M. Turnaturi, "Role of Threshold Voltage Shift in Highly Accelerated Power Cycling Tests for SiC MOSFET Modules," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*. Available online doi: 10.1109/JESTPE.2019.2894717