

IET

Power and Energy Series 59



Ultracapacitor Applications

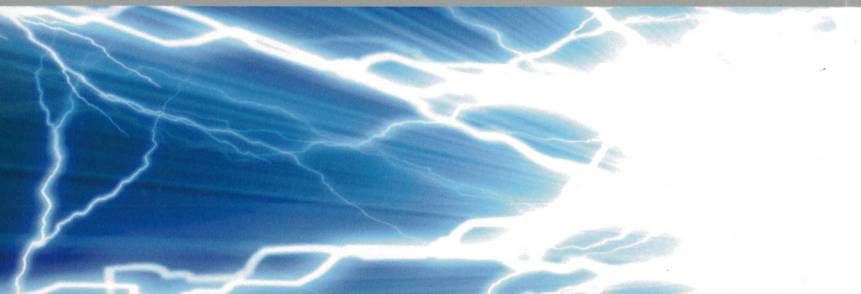
John M. Miller

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Ultracapacitor Applications

Energy storage and in particular electrical storage of energy has become a very talked about topic in circles ranging from lay persons, in regard to hybrid and battery electric vehicles, to professionals, and certainly by legislators and energy policy makers in government. But even to professionals the distinctions between physical and chemical forms of electric energy storage are unclear and at times poorly understood, if at all. This book takes a critical look at physical storage of electricity in the devices known collectively as electrochemical capacitors and particularly as ultracapacitors. In its 12 chapters, this text covers ultracapacitor and advanced battery topics with emphasis on clear understanding of fundamental principles, models and applications. The reader will appreciate the case studies ranging from commercial to industrial to automotive applications of not only ultracapacitors, but of these power dense components in combination with energy dense battery technologies.

Dr. John M. Miller was vice president of systems and applications at Maxwell Technologies when this book was written. He is currently with the U.S. Department of Energy, Oak Ridge National Laboratory, National Transportation Research Center. He is also founder and principal engineer of J-N-J Miller Design Services, P.L.C. Dr. Miller worked for 20 years in the automotive industry, leading several hybrid vehicle technology programs including 42V Integrated Starter Alternator, ISG, for application into a SUV. He has been active in collaborations at the industry and government levels including the NSF funded systems center for Future Renewable Electric Energy Delivery and Management, FREEDM. He was actively engaged in MIT's Consortium on Advanced Automotive Electrical and Electronic Components and Systems and has served as Adjunct Professor of Electrical Engineering at Michigan State University and at Texas A&M University. Dr. Miller has authored over 170 technical publications, holds 53 U.S. patents, and authored or co-authored five books. He is a Fellow of the IEEE, Member of SAE, 2009 recipient of the IEEE Kilman Innovator award, and 2010 recipient of the IEEE Power Electronics Society distinguished service award.

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