Analysis and Design of High Efficiency, High Conversion Ratio, DC-DC Power Converters

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Abstract: In 2010, more than 2% of all electricity generated in the United States was used to power data centers. Estimates indicate that as many of 85% of data centers constructed prior to 2006 expend more than three times as much electric power on cooling and inefficient conversion than on powering the server hardware itself. Though the power distribution architectures in these data centers vary greatly, they each stand to benefit significantly from well-designed, highly efficient power converters to step down the high DC voltages generated in AC rectification to the low voltages DC voltages capable of being distributed across the server motherboard. This application area has unique requirements for the power electronics designer, including constraints on form factor, efficiency, and dynamic response. This seminar will address the analysis and design of high efficiency, high step-down, high frequency DC-DC converters for data centers and other applications.

Biography: Daniel Costinett received the B.S. and M.S. degrees in electrical engineering from the University of Colorado, Boulder in 2011. Currently, he is working toward the Ph.D. degree in power electronics from the Department of Electrical, Computer, and Energy Engineering, Colorado Power Electronics Center, University of Colorado, Boulder while assisting with course development at the Department of Electrical and Computer Engineering at Utah State University in Logan, UT.

His current research interests include resonant and soft switching converters, high efficiency converters for data centers, energy harvesting, mixed-signal IC design, implantable devices, and electric vehicles.