Electrical and Computer Engineering Department Colloquium

"Ultra-high Efficiency Power Conversion Technology for Wide Voltage Range Applications"

Abstract There is increasing demand to use wide input voltage range power converters in industrial, railway, aerospace, battery-powered, advanced computing, and server applications. A wide input voltage range converter provides great flexibility, helping system designers cope with changes in power requirements. They can act as a one-fit-all solution when one application requires different voltage ranges. Power converters can usually achieve high efficiency at a specific input voltage. However, their efficiency drops drastically once the input voltage deviates from the optimal value. A lower efficiency power converter generates more loss and needs bulkier heatsinks to reduce temperature rise. A wide input voltage range power converter often achieves a much lower power density than a narrow input voltage range counterpart. This presentation will discuss the general challenges of maintaining high-efficiency power conversion under a wide input voltage range. Specific