



Practical Design and Challenges of Traction Inverter for Electrified Vehicles

Abstract:

Specifications provided by automakers for electric drive vary considerably and can leave the traction inverter suppliers with many questions regarding power delivery and key component selection. Requirements the traction inverter designer must meet include voltage and current ratings, steady-state and transient power delivery, high reliability and durability, size, package, and cost, etc. However, compared with regular inverter designs, the harsh vehicle operating environment and worst case scenarios usually are not fully understood by designers until their inverters are failed in vehicle test. The intent of this seminar is to introduce the design and challenges of traction inverter for electrified vehicle applications from a practical point of view. Traction inverter design specifications derived from vehicle applications will be explained; questions and concerns an inverter designer might have will be addressed by technical details and benchmarking inverter examples. Inverter key component selection and sizing will be intensively discussed. Vehicle operation related extreme conditions and worst case scenarios which usually drive the inverter design will also be explained. The attendee should leave the seminar with improved knowledge of particular requirements of traction inverter design and practical challenges. The seminar is to aid design engineer better understanding of traction inverter design to meet automotive application requirements. It should also be of interest to engineers who work on power electronics circuitry for various power conversion applications.

Lead Instructor:

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Instructor Bio:

Lihua Chen received his Ph.D degree from Michigan State University in 2008, and received his MSEE and BSEE from Changchun University of Science and Technology in 1993 and 1996, respectively. Since Jan. 2008, he is with Ford Motor Company as a Product Design Engineer responsible for traction inverter design. From 1999 to 2002 has been with Argonne National Lab as a Visiting Researcher, and before that, he has been with Changchun University of Science and Technology as an Assistant Professor for three years. Since 1996, he has been involved in various researches and production development. He has published more than 40 technical papers and given numerous technical presentations. His research interests include high power converter and inverters; intelligent gate drive for high power devices; and vehicle electrification.