

Increasing Efficiency of Electric Vehicle Powertrain using IGBT inverters

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Summary

Given the cost of semiconductors and limited space for power inverters in electric and hybrid vehicle applications, the demand for higher efficiency from power electronics and controls is increasing. Greater efficiency has a direct impact on the packaging size of the semiconductors, the battery capacity, the cooling system, and other powertrain components.

This presentation discusses the different solutions used today with a goal of reducing IGBT losses and expresses the limitations of these solutions. A new improved gate driver technology is presented with description on how it can significantly improve IGBT switching losses. Additional improvements are presented on the topic of advanced motor control algorithms for better thermal management.

Keywords: control system, converter, DC-AC, efficiency, electric drive, inverter.

This paper is going to be a presentation only based on TM4 innovative technology and the following papers:

References

- [1] Cyr Jean-Marc, *"Optimisation of IGBTs During the Commutation Process"*, ISBN 1-55963-704-8, Washington, Island Press, 2005.
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Authors



Christian Pronovost received a B.S. degree from École Polytechnique de Montréal in Canada in 1992. Mr. Pronovost has been with TM4 since 1998 as senior electrical engineer. He has been involved in the design of the core technology of current motors and inverters for automotive electric powertrain technologies. He is currently working as Product Strategy Manager for TM4's product line; he is acting as lead product engineer defining market needs and innovative solutions.