OVERVIEW
Timeline
• Fiscal year: FY16
• Project start date: FY15
• Final report: FY17

Budget
• Funding for FY16: $200K

RELEVANCE
• Work with industry to reduce the weight, volume, and cost of vehicle mission-critical systems by providing informatics to influence design and prototyping.
• Guide future electric drive technologies (EVT) research and development (RD) efforts

OBJECTIVES
Overall objective: Understand the current state of the art (SOA) in thermal management systems and develop technologies to improve the SOA.

• Identify thermal advantages and disadvantages of systems.
• Establish baseline metrics for the thermal management systems.
• Increase the publicly-available information related to automotive thermal management systems.
• Determine the operating temperatures for the EVT components and systems.
• FY16 objective: Benchmark the thermal management systems for the 2014 Honda Accord power electronics system and 2015 BMW i3 power electronics and electric motor systems.

SUMMARY
Relevance
• This work will increase the understanding of the current SOA in thermal management systems and identify methods to improve the SOA.

Approach
• Collaborate with industry and ORNL to identify the appropriate components to benchmark.
• Characterize the thermal performance of the power electronics and motor thermal management systems.

Accomplishments
• Completed characterizing the performance of the 2012 Nissan LEAF power electronics thermal management systems.
• Completed characterizing the performance of the 2014 Honda Accord power electronics thermal management systems.

FUTURE WORK/CHALLENGES & BARRIERS
• Characterize and identify methods to improve the performance of the 2014 Honda Accord power electronics system.
• Characterize and identify methods to improve thermal performance of the 2013 BMW i3 power electronics and electric motor thermal management systems.

COLLABORATION
Oak Ridge National Laboratory (ORNL)

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