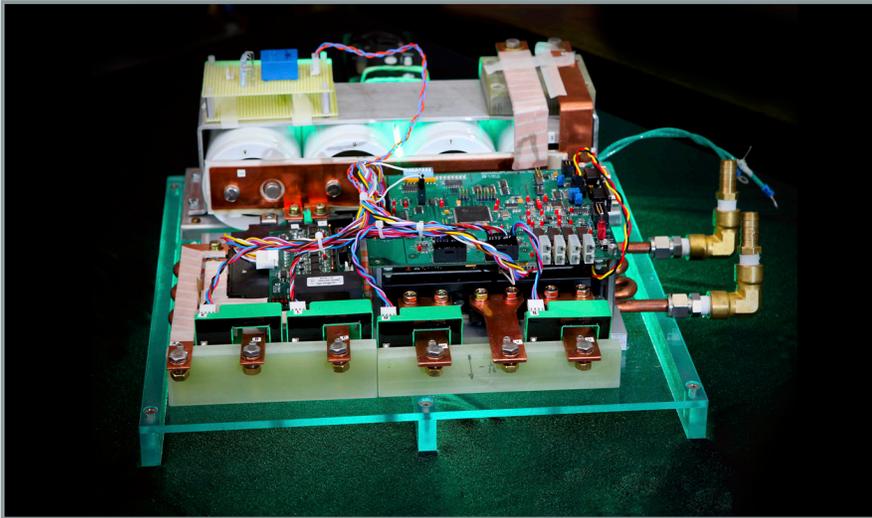


# Power Charging and Supply System for Electric Vehicles

UT-B ID 200601740



## Technology Summary

A versatile new power electronics system for electric and hybrid electric vehicles (EVs/HEVs) solves several key challenges in green transportation. Current EVs and plug-in HEVs require an external plug-in charger powered by the utility grid. This ORNL technology eliminates the need for an external charger and enables these vehicles to function as mobile electrical power generators for emergency and other uses.

The technology integrates the battery-charging function into the electrical motor drive system. By using only the onboard inverter and motor without adding any inductors or switches, this system reduces component cost. The system also remedies problems such as inadequate battery capacity and inconvenient chargers.

Specifically, this power electronics system transfers power between an energy storage device, an onboard electrical power generator, a vehicle drive shaft, and an external load. A mode selection switch tells an electronics controller to operate in one of three modes: propulsion mode, for driving the vehicle; charging mode, for charging the battery; or sourcing mode, for supplying power to external loads.

## Advantages

- Integrates level 1 (slow) and level 2 (fast) battery charging functions into the electrical motor drive system
- Enables hybrid vehicles to supply power to external loads without additional components
- Functions as a mobile electrical power generator for emergency and other uses

## Potential Applications

- Electric vehicles
- Hybrid electric vehicles

## Patent

Gui-Jia Su, *Electric Vehicle System for Charging and Supplying Electrical Power*, U.S. Patent 7,733,039 B2, issued June 8, 2010.

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