

# APEI

## POWERFUL, EFFICIENT ELECTRIC VEHICLE CHARGERS

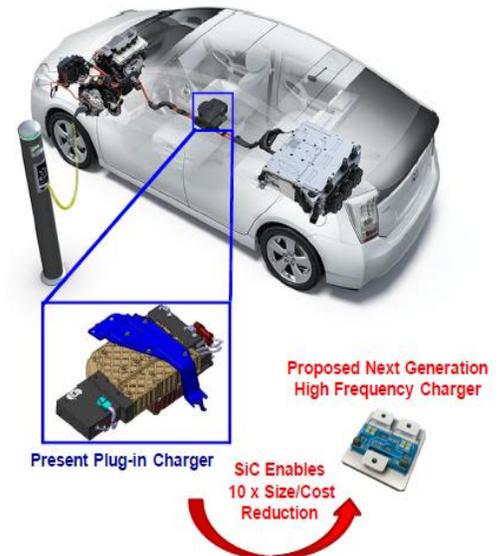
<b>PROJECT TITLE:</b>	Low-Cost, Highly Integrated, Silicon Carbide Multi-Chip Power Modules for Plug-in Hybrid Electric Vehicles		
<b>ORGANIZATION:</b>	Arkansas Power Electronics International (APEI)	<b>LOCATION:</b>	Fayetteville, AR
<b>PROGRAM:</b>	ADEPT	<b>ARPA-E AWARD:</b>	\$3,914,527
<b>TECH TOPIC:</b>	Vehicle Technologies	<b>PROJECT TERM:</b>	9/14/10 – 9/13/13
<b>WEBSITE:</b>	www.apei.net		

### CRITICAL NEED

All electric devices are built to operate with a certain type and amount of electrical energy, but this is often not the same type or amount of electrical energy that comes out of the outlet in your wall. Power converters modify electrical energy from the outlet to a useable current, voltage, and frequency for an electronic device. Power stations also use power converters on a larger scale to modify electrical energy so it can be efficiently transmitted. Today’s power converters are inefficient because they are based on decades-old technologies and rely on expensive, bulky, and failure-prone components. Within the next 20 years, 80% of the electricity used in the U.S. will flow through these devices, so there is a critical need to improve their efficiency.

### PROJECT INNOVATION + ADVANTAGES

Currently, charging the battery of an electric vehicle (EV) is a time-consuming process because chargers can only draw about as much power from the grid as a hair dryer. APEI is developing an EV charger that can draw as much power as a clothes dryer, which would drastically speed up charging time. APEI’s charger uses silicon carbide (SiC)-based power transistors. These transistors control the electrical energy flowing through the charger’s circuits more effectively and efficiently than traditional transistors made of straight silicon. The SiC-based transistors also require less cooling, enabling APEI to create EV chargers that are 10 times smaller than existing chargers.



### IMPACT

If successful, APEI would make it faster and easier to charge EVs, helping to facilitate their widespread use.

- **SECURITY:** Widespread use of EVs would reduce fossil fuel consumption and reliance on foreign sources of fuel.
- **ENVIRONMENT:** Increased use of EVs could reduce the number of gas-powered vehicles and their harmful emissions.
- **ECONOMY:** Making it cheaper and easier to charge EVs would save consumers time and money.
- **JOBS:** Jumpstarting the domestic EV industry could create jobs in manufacturing, distribution, and sales.

### CONTACTS

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