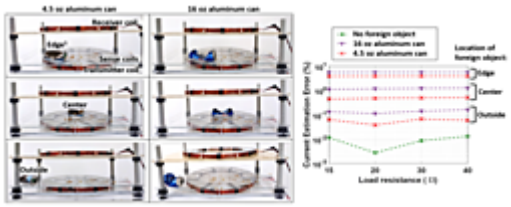
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Foreign Object Detection for Wireless Power Transfer

TECHNOLOGY NUMBER: 2019-456



OVERVIEW

Measure disturbance to the wireless charging field due to foreign objects

- Functions without any dead zones in the field of measurement
- Provides a cost effective and sensitive means for wireless charging

BACKGROUND

Wireless charging stations have become increasingly popular for charging electric vehicles because they are convenient and easy to use. These charging stations utilize electromagnetic fields to transfer energy wirelessly from the charging station to the electric vehicle's battery. The magnetic fields are generated by electric current flowing through a coil, enabling an electric current in a second coil placed near that magnetic field. While the wireless charging of electric vehicles provides advantages over wired devices, keeping the interface space clear of foreign objects is important to maintain charging efficiency and optimize safety. The accidental positioning of foreign objects may lead to the generation of heat and result in fires. As such, a need exists for a technology that is capable of minimizing the risks associated with the presence of foreign objects in wireless power transfer devices.

INNOVATION

Researchers have invented a modified version of an electromagnetic detection model for wireless power transfers. This modified model may detect foreign objects and can quantify the resulting disturbance to the wireless charging field. The calculated level of disturbance can then be used to define a metric that characterizes danger levels for unintended consequences such as initiation of fires. The ability of the device to detect a foreign object negates the need for separate detection circuitry, given that the wireless power transfer hardware intrinsically performs that function. The technology is free of dead ones within its field, so it is capable of

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Category

Hardware
Engineering & Physical Sciences
Semiconductor, MEMS, and Electronics

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detection within its entire sphere of measurement. This highly sensitive and cost-effective invention may be widely applied in charging stations to safely and efficiently improve wireless power transfer.

PATENT APPLICATION

Number: 17/348,645