Cryptography System for Wireless Charging Modules

Technology #20264

Applications

This technology secures power transfer between compliant wireless chargers and devices. Through public authentication key protocol, this technology can provide wireless power to multiple devices at once, such as in Internet of Things (IOT) applications.

Problem Addressed

Coupled inductors enable wireless recharging of personal electronics, wearable technologies, and IOT devices. Counterfeit wireless chargers that do not fulfil power specs of a device can send harsh transient signals, causing damage in the device's battery and surrounding hardware. Secure hash algorithm (SHA) authentication protocols have been used to avoid charging problems between a charger-device pair. Unfortunately, these security protocols are not suitable for IOT systems, where a charger supplies power to multiple receivers.

Technology

This technology employs a cryptography method that validates access keys in order to allow charging between wireless receivers and compliant chargers. The cryptography method follows a public authentication key protocol, where a receiver stores multiple public keys and a charger stores a single private key. If one of its public keys pairs with a charger's private key, the receiver establishes a secure connection and begins the wireless power transfer process. A receiver also contains an envelope detector, which determines if the receiver is in proximity to the charger for successful power transfer.

Advantages

- Secure wireless power transfer
- Wirelessly charge multiple devices using one compliant charger

Intellectual Property

IP Type: Granted Patent

IP Title: Detuning for a resonant wireless power transfer system including cryptography

IP Number: 10,651,687

IP Type: Published PCT Application

255 Main Street, room NE 18-501
Cambridge, MA 02142-1601
Phone: 617-253-6966 Fax: 617-258-6790
http://tlo.mit.edu
Contact the Technology Manager: tlo-inquiries@mit.edu

IP Title: Detuning for a resonant wireless power transfer system including cryptography

IP Number: WO2019/156868

Categories For This Invention:

Electronics & Circuits
Energy
Energy Storage
Other (Energy Storage)

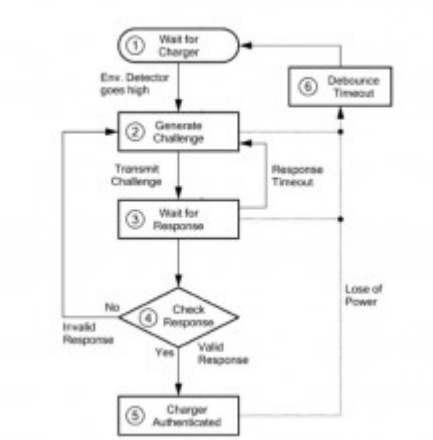
Inventors:

Anantha Chandrakasan
Nachiket Desai
Chiraag Juvekar
Shubham Chandek

External Links:

Energy-Efficient Circuits and Systems Group
http://www-mtl.mit.edu/researchgroups/icsystems/

Image Gallery:



255 Main Street, room NE 18-501
Cambridge, MA 02142-1601
Phone: 617-253-6966 Fax: 617-258-6790
http://tlo.mit.edu
Contact the Technology Manager: tlo-inquiries@mit.edu