

Introduction of Capacitive Power Transfer Technology

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Keynote Speaker

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Short Biography

Reiji Hattori received his M.S. and B.S. degrees in electrical engineering from Osaka University, Japan, in 1988 and 1986, respectively. He became a research associate at the Department of Electrical Engineering, Osaka University, in 1989 and received his Ph.D. degree from the same university in 1992. He moved to Kyushu University, Fukuoka, Japan, as an associate professor in 1997 and he was promoted to a professor in 2009. He is now working on OLED and electronic paper technologies. He is a member of SID, IEEE, IEICE and JSAP. He awarded Distinguished Paper of SID'04.

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Abstract

Wireless power transfer (WPT) technology is expected for eliminating troublesomeness of connecting an electronic cable. The development of WPT technology has a long history since Nikola Tesla built up Wardencllyffe Tower located in Long Island, New York for developing a WPT system in the early 1980's. But it cannot be said that WPT technology is widely spread in a current human life space enough. The reason is that it cannot find the specific application which only WPT can achieve yet.

There are two types of WPT for short-range power transmission. One is the inductive coupling power transfer (IPT), and the other is the capacitive coupling power transfer (CPT). We have been working on the development of CPT technology although it is a minor one comparing with IPT because it has unique features such as wide transfer area, simple structure, and so on.

In this presentation, three CPT applications we have developed are presented. The first application is to an e-Paper, a reflective display showing a paper white appearance. We could eliminate the battery from the device, which enables the real paper-like shape. The second application is for an organic light-emitting diode (OLED) lighting, a new lighting using OLED. The lighting panel consists of only OLEDs with flexible plastic substrate and rectifying diodes, which results in a very simple and ultrathin lighting device. The last is for a drone or a small multicopter. By using CPT system, a wide charging area for the drone to land especially required at autonomous flying was provided.