Nuttakron Keratipaiboon 2014: A Control Design for Inductively Coupling Power Transfer Systems. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Siriroj Sirisukprasert, Ph.D. 171 pages.

This thesis presents a maximum power transfer technique for Inductively Coupling Power Transfer (ICPT) Systems by searching the appropriated switching frequency based on the maximum direct current of the DC power supply. In this thesis, an ICPT system is studied in the frequency response between the direct current (I_{DC}) on the primary side and the output power (P_O) on a load side when the components of an ICPT system (the capacitor compensation topologies, the shape of coil, air-gap and resonant frequency) are changed. To understand and verify the designing of the proposed control method, two experiments have been conducted in this thesis. The first experiment is set up to understand the frequency response of the direct current and the output power when the components of the ICPT system are changed. By the first experiment, the results show that the output power is related to the direct current. While the input direct current reaches the maximum value, the output power also reaches the maximum value. This happens regardless of the changes of e the capacitor compensation topologies, the shape of coil, the air-gap and the resonant frequency. In the second experiment, the efficiency of the proposed control method has been verified by the comparing between the proposed control method and the conventional method (direct charging from the DC power supply) in case of the portable electronic devices charging. From the research results, a high efficiency wireless power transfer control technique can be simply achieved.

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