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Analysis and Optimal Design of the Transmission Coils for the Wireless Power Transmission System

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With the development of the technology, the wireless power transfer (WPT) which can realize power transmission without wires has attracted much attention in recent years. This technology is promising in the applications of mobile devices charging and biomedical implant powering with the advantages of contactless and flexible. In the WPT system, the transmitting and receiving coils are the core components for the power transmission. It affects the system efficiency and the transmission power directly. In this paper, a comprehensive analysis of the transmitting and receiving coils is conducted based on the circuit and electromagnetic simulation. The effects of the structural parameters and the magnetic core of the coils on the power transfer performance are studied. Finally, aiming at the improvement of the transmission power and efficiency, an optimal design of the coils is carried out according to the characteristics of the WPT system.

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