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General Analysis of Resonance Coupled Wireless Power Transfer (WPT) Using Inductive Coils

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Abstract

In this paper, parameter analysis of the inductive coils is evaluated for low power Wireless Power Transfer (WPT) applications. Inductive coils are the major element used in the WPT systems, in which different shaped coils are employed. The selection of coils is very critical, depends purely on the fundamental characteristics (shape and geometry) of the coils. In order to design a better system, three different shapes of coils, namely, circular, square and rectangular are designed and analysed. The vital parameters such as self-inductance, mutual inductance, quality factor, magnetic field and efficiency are evaluated for all three coils. It is observed that these parameters are maximal for circular as compared to the other two shapes. The circular coils produce higher voltage efficiency of 29% as compared to rectangular (25%) and square (23%) shaped coils. Thus, this paves a way to other researchers to suitably select circular inductive coils for wireless electricity applications.

Keywords

Author Keywords: [geometry and shape of coils](#); [quality factor](#); [resonant inductive coupling](#); [self and mutual inductance](#); [wireless power transfer](#)

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