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PERFORMANCE ANALYSIS ON DYNAMIC WIRELESS CHARGING FOR ELECTRIC VEHICLE USING FERRITE CORE
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Abstract
The technology of dynamic Wireless Power Transfer (WPT) has been accepted in the Electric Vehicle (EV) industry. Recently, for a stationary EV charging system, the existence of a ferrite core improves power efficiency. However, for dynamic wireless charging, the output power fluctuates when the EV moves. Two main obstacles that must be dealt with is air-gaps and misalignment between the coils. This paper investigates clear design guidelines for fabrication of an efficient Resonant Inductive Power Transfer (RIPT) system for the EV battery charging application using a ferrite core. Two different geometry shapes of ferrite core, U and I cores, will be investigated and tested using simulation and experimental work. The proposed design was simulated in JMAG 14.0, and the prototype was tested in the laboratory. The expected output analysis from these two techniques was that the power efficiency of the ferrite pair should first be calculated. From the analysis and experimental results, it is seen that the pair of ferrite cores that used a U shape at the primary and secondary side provides the most efficient coupling in larger air-gap RIPT application with 94.69% on simulation JMAG 14.0 and 89.7% from conducting an experiment.

Author Keywords
Dynamic wireless charging; Electric vehicle (ev); Ferrite core; Inductive wireless charging

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