Coupling wireless power transfer system

Segmented dynamic wireless power transfer (DWPT) systems can solve the problems of large battery size, long charging time, and the limited driving range of electric vehicles (EVs). Aiming at the load voltage fluctuation caused by the mutual inductance drop when moving over two adjacent transmitting coils, this paper proposes a novel segmented DWPT system ...

Inductive Coupling: Inductive wireless charging uses electromagnetic fields to transfer power between two coils - a transmitter coil in the charging pad or base station and a receiver coil in the device being charged. When the coils are closely aligned, electrical current flows through the receiver coil, which can then be used to charge a ...

Wireless Power Transfer (WPT) using inductive and magnetic resonance coupling developing at enormous pace due to its diversity of applications, such as electric vehicles (EV), biomedical implants, consumer electronics, robotics and so on. This review presents historical background together with applications of low power and high power WPT systems. The review emphasizes ...

In order to improve the effective transfer range and then enhance the interoperability of magnetic coupling wireless power transfer (MC-WPT) systems, an electromagnetically induced transparency (EIT)-like MC-WPT system is proposed in this paper, which can maintain a reasonable level of power and efficiency over a wide range of transfer ...

Inspired from Tesla"s ideas from the late 1890s, wireless power transfer (WPT) has seen significant growth over the years. 1 Modern Electric Vehicles (EVs) are a way better option for the traditional underlying fossil fuel vehicles as they considerably emit fewer greenhouse gases. In 2018, greenhouse gas emissions from the transportation sector constituted roughly ...

Low-power magnetic coupling resonant wireless power transfer (MCRWPT) systems are less efficient at long transmission distances due to magnetic leakage and losses. For this reason, combining ferrite-nanocrystalline hybrid shielding and a relay coil, an improved MCRWPT system based on the LCC-LCC compensation network is designed in this paper.

This paper gives an overview of optimizing wireless power transfer systems using magnetic coupling. Optimization aims to maximize either the power transfer eciency or the transferred power. The resulting load calculation and matching strategies are revisited. Moreover, the coupling system is described, starting with its equivalent circuit

A wireless power transfer (WPT) system offsets these issues of conventional wired power transfer by transferring power wirelessly. Technologies based on time-varying electric, magnetic, or electromagnetic

fields are employed for wireless power transfer.

The wireless power transfer (WPT) technology makes up for the defects of traditional power supply mode, and has a wide application prospect in UAVs, electric vehicles, biomedical and other aspects [1,2,3] WPT system, when the coupling coils are misaligned, the mutual-inductance between the coupling coils will produce varying degrees of fluctuation, ...

The importance of Wireless Power Transfer (WPT) lies in its potential to make a significant contribution to sustainability. Traditional approaches to the distribution of electricity are associated with substantial inefficiencies, resulting in notable losses during the processes of transmission and storage [1, 2].WPT systems that utilize resonant inductive coupling, radio ...

Targeting the simultaneous wireless charging of multiple receiver (RX) coils, we developed a coupling coefficient (${k}$) sensorless wireless power transfer A 6.78-MHz Coupling Coefficient Sensorless Wireless Power Transfer System Charging Multiple Receivers With Efficiency Maximization by Adaptive Magnetic Field Distributor IC | IEEE ...

Along with the technology boom regarding electric vehicles such as lithium-ion batteries, electric motors, and plug-in charging systems, inductive power transfer (IPT) systems have gained more attention from academia and industry in recent years. This article presents a review of the state-of-the-art development of IPT systems, with a focus on low-voltage and ...

Of particular interest for designers is the discussion of implementation and operational aspects, standards, and safety relating to regulations. A high-level catalog of potential applications maps these to adequate technological options for wireless power transfer.

This paper gives an overview of optimizing wireless power transfer systems using magnetic coupling. Optimization aims to maximize either the power transfer efficiency or the transferred power. The resulting load calculation and matching strategies are revisited.

Wireless Power Transfer (WPT) enables power to be transferred from a grid or storage unit to a device without the need for cable connections. This can be performed by inductive coupling of magnetic fields as well as by direct radiative transfer via beams of electromagnetic waves, commonly radiowaves, microwaves or lasers.

This paper delved into the thermal dynamics and stability of Wireless Power Transfer (WPT) systems, with a focus on the temperature effects on the coil structure. Using the Finite Element Method (FEM), this study investigated both unidirectional and bidirectional coupling field simulations, assessing their impacts on the transmission efficiency of LCL-resonant WPT ...

Designing a capacitive wireless power transfer system is challenging due to the variable coupling capacitance

caused by the physical misalignment of the plates of the coupling capacitor. This paper presents a double-sided LC-compensated capacitive wireless power transfer system. An admittance-based matching network design is proposed and analyzed in ...

OverviewHistoryField regionsNear-field (nonradiative) techniquesFar-field (radiative) techniquesEnergy harvestingUsesSee alsoWireless power transfer (WPT; also wireless energy transmission or WET) is the transmission of electrical energy without wires as a physical link. In a wireless power transmission system, an electrically powered transmitter device generates a time-varying electromagnetic field that transmits power across space to a receiver device; the receiver device extracts power from the field and supplie...

Wireless power transfer (WPT) systems, which have been around for decades, have recently become very popular with the widespread use of electric vehicles (EVs). In this study, an inductive coupling WPT system with a series-series compensation topology was designed and implemented for use in EVs. Initially, a 3D Maxwell (ANSYS Electromagnetics ...

Although the wireless power transfer (WPT) system for electric vehicles (EVs) provides numerous advantages, there is still a low coupling coefficient and the misalignment between the primary coil and the secondary coil needs to be solved. In this paper, the transmission efficiency and transmitted power were calculated based on Series-Series (SS) ...

Wireless power transfer by employing inductive coupling has been well-refined in recent years. It works on the principal of electromagnetic induction i.e., a time varying voltage in a coil generates a fluctuating electromagnetic field, ... In a two-coil magnetic coupling system, ...

Wireless power transfer (WPT) provides a safe and independent transfer of energy without the constraints of cables. The most suitable method for wireless charging of Electric Vehicles (EVs) is magnetic resonance coupling, which transfers energy in the near field.

The cross-coupling among coils makes it complex to analyze and understand the circuit characters of multiple-relay wireless power transfer (MR-WPT) systems. In order to describe and explain the interaction among cross-coupled coils, this article proposes a novel method named the transfer coefficient model (TCM), which is derived by the lower-diagonal-upper (LDU) ...

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