



Inductive power storage design

The design of a single-stage IPT converter that complies with the battery charging profile and, at the same time, achieves optimal efficiency is described. This paper studies wireless charging of lithium-ion batteries for electric vehicles. The charging profile mandates a constant-current (CC) charging for a discharged battery until the battery voltage ...

Design of a Single-Stage Inductive-Power-Transfer Converter for Efficient EV Battery Charging Zhicong Huang, Student Member, IEEE, Siu-Chung Wong, Senior Member, IEEE, and Chi K. Tse, Fellow, IEEE
Abstract--This paper studies wireless charging of lithium-ion batteries for electric vehicles. The charging profile mandates a

The inductive power transfer (IPT) is expected to greatly contribute towards electrification in transportation. ... storage sizing, design of pads and power electronics, up to the realization of the final prototype. ... 2021. "Design and Realization of an Inductive Power Transfer for Shuttles in Automated Warehouses" Energies 14, no. 18: 5660 ...

It has a simple design and offers better performance compared to other energy storage devices in terms of life cycle and efficiency. However, it suffers from size and weight problems due to the nature of linear inductors. ... Particle accelerators require short, high-power pulses. Inductive energy storage devices fulfill this requirement ...

The power loop inductance of 1.6 nH is noticeable lower than known from conventional power module setups. The low inductive design allows for very fast switching with low over-voltage and minimum ...

This presents design challenges for inductive power transfer (IPT) chargers to achieve high efficiency. In this article, a multiband frequency tracking control is proposed to match CC and CV modes ...

To achieve long distances, in the range of meters, far-field is preferred because the beam can be pointed toward the Rx. This beam-based WPT system can transfer large power (kilowatts) at large distances (tens of meters) with high efficiency (>50%) at the risk of interference with other radio signals []. However, for short distances (tens of centimeters), higher efficiencies ...

The size of Wide Band Gap (WBG) power electronics based converter is often determined by the inductive component. Therefore, high power density inductor design is required to reduce ...

The inductive power transfer (IPT) is expected to greatly contribute towards electrification in transportation. In fact, IPT charging technology has the potential to overcome several limitations of conductive charging: in particular, the process can ... storage sizing, design of pads and power electronics, up to the realization of the final ...



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There are two types of WPT technologies that are widely used in EV systems, namely inductive power transfer (IPT) and capacitive power transfer (CPT) [7,8]. While IPT uses coupled coils to transfer the power by a ...

The design, construction and evaluation of a contactless battery charger for electric vehicles (EVs) based on inductive power transfer (IPT) is presented in this study. The design of such systems entails a high degree of ...

Electric vehicle (EV) technology has proven to be a propulsion technology of the future but urgently needs to address challenges such as lower-priced, reasonably sized EV for higher market penetration, higher life cycle ...

This paper presents an integrated coil design method for inductive power-transfer (IPT) systems. Because a medium-voltage direct current (MVDC) distribution network transmits power at relatively high voltages (typically in the tens of kV), accurate fault diagnosis using high-performance sensors is crucial to improve the safety of MVDC distribution networks. ...

single-stage power conversion process to facilitate bi-directional and contactless power transfer between EVs and the grid. Without an additional power conversion stage, the IPT power ...

A design study for a 1 MJ inductive generator clearly showed the advantages of this switch compared to ... HE PULSED-power supply using an inductive storage has been developed by many researchers ...

Inductive power transfer (IPT) technology offers a promising solution for electric vehicle (EV) charging. It permits an EV to charge its energy storage system without any physical connections using magnetic coupling between inductive coils. EV inductive charging is an exemplary option due to the related merits such as: automatic operation, safety in harsh ...

What is Wireless and Inductive Power Transfer (IPT)? ... The magnetic coupling stage is the most important part deciding the design of power electronics, efficiency, and transferable power. ... this could lead to an increasing need of large land space to cover peak power demands. Smart grid storage systems, however, can reduce the required peak ...

2 Data Storage Institute, Agency of Science, Technology and Research Design and Optimization of Inductive Power Link for Biomedical Applications. 10 Biomedical Engineering / Book 1.

For all-electric mobile systems, inductive pulsed power generators represent a very attractive alternative to capacitive generators. This is due to their high energy density, low charging voltage, short charging time and to the fact that they can easily be combined with modern high-power (lithium-ion) batteries. In particular, storage coils embedded in a so-called ...



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Inductive power transfer (IPT) is an innovative approach for EV battery charging owing to the possibility of wireless supply, which prevents the use of electric cables to start the charging operation.

This paper presents a novel compensation parameter design methodology and maximum efficiency tracking (MET) control strategy for inductive power transfer (IPT) system with an inductance and double ...

The pulsed power supply (PPS) is one important component in the electromagnetic launch system. The inductive PPSs have attracted researchers' attentions with the major advantages of high energy ...

Recently loosely coupled inductive power transfer (IPT) has gained worldwide attention for battery charging applications for electric vehicles (EVs). Since a high frequency operation is a must for transferring power inductively over a large air gap with reasonable efficiency, a careful design is needed. This paper reviews the basic design considerations for ...

The inductive power transfer (IPT) is expected to greatly contribute towards electrification in transportation. ... storage sizing, design of pads and power electronics, up to the realization of the final prototype. ...

generators, especially using an inductive storage to constitute circuits. Compared to high-voltage generators, pulsed current generators with high pulsed voltage can be used in many applications of pulsed power techniques, like the driver of accelerator, surface treatment of materials, ion source and so on.

Inductive power transfer (IPT) allows power transfer over an air gap without physical contact between the primary and secondary side. This is attractive for applications such as ultraclean ...

The proper magnetic design is one of the most difficult and critical phases in developing an inductive power transfer system, especially for electric vehicle charging.

Such a setup has the advantages of simplicity, low price, small size, and low weight and is suitable for microsatellites. Moreover, a "trigger-less" method with an inductor storage power system was used for generating the pulsed plasma. This discharge method can significantly reduce input power.

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 ...

A broad overview of long-charge inductive storage systems technology based on more than 10 years development experience at Soreq NRC is presented. Key issues are addressed: a) System architecture; b) Essential components, with an emphasis on repetitive opening switch and coil screening; c) Efficiency of coupling to various loads, such as ET and ...



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Nowadays, Wireless Power Transfer (WPT) technology is receiving more attention in the automotive sector, introducing a safe, flexible and promising alternative to the standard battery chargers. Considering these ...

This paper presents an integrated coil design method for inductive power-transfer (IPT) systems. Because a medium-voltage direct current (MVDC) distribution network ...

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