Design of wireless power transfer system with class e oinverter

Magnetic coupling resonant Wireless Power Transfer (WPT) System is widely used in the medium distance field as a novel technology. This paper presents a WPT system with a proper Class-E inverter structure. In order to solve the problem of the frequency splitting in WPT system. A method is proposed in the system to trace the emission frequency and the receive ...

2 Analysis of class-E inverter and class-e rectifier A Class-E2 dc/dc converter consists of a Class-E inverter and a Class-E rectifier as shown in Fig. 3a. In this section, the operation of this converter is analysed. The equivalent circuit of the Class-E2 converter is depicted in Fig. 3b. To make the analysis of Class-E

Block diagram of a general capacitive wireless power transfer system. To capitalize on these advantages over IWP T, several research projects have recently started to study and improve CWPT [10].

This paper proposes a high-frequency multiple-receiver wireless power transfer (WPT) system with a load-independent class-E/F inverter. Each receiver has a post-regulator, which changes the equivalent resistance seen from the inverter to obtain the necessary power for output voltage regulation. Because the load-independent class-E/F inverter generates constant AC current (...

A wireless power transfer system was designed to drive LED unit of 100 W. Class-DE inverter was designed for this application for efficient energy transfer. The output of receiver was smoothened by proper resonant circuit design, ...

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Abstract: This paper presents a resonant inductive coupling wireless power transfer (RIC-WPT) system with a class-E 2 dc-dc converter along with its analytical design procedure. By using the class-E inverter as a transmitter and the class-E rectifier as a receiver, the designed WPT system can achieve a high power-conversion efficiency because of the class-E ZVS/ZDS conditions ...

This paper presents a capacitive power transfer (CPT) system using a Class-E resonant inverter. A Class-E resonant inverter is chosen because of its ability to perform DC-to-AC inversion efficiently while significantly reducing switching losses. The proposed CPT system consists of an efficient Class-E resonant inverter and capacitive coupling formed by two flat ...

In the simulation results, the system achieved 79.0 % overall efficiency at 5 W (50 ?) output power, coupling coefficient 0.072, and 1 MHz operating frequency, which indicates the validity of the design procedure. This paper presents a resonant inductive coupling wireless power transfer (RIC-WPT) system with a class-DE and class-E rectifier along with its analytical ...

This paper proposes a wireless power transfer system with Class E inverter and half-bridge Class DE rectifier. The proposed system consists of a Class E inverter, a half-bridge Class DE ...

Aldhaher S, Luk P-K, Bati A, Whidborne J (2014) Wireless power transfer using Class E inverter with saturable DC-feed inductor. IEEE Trans Ind Appl 50(4):2710-2718. Google Scholar Hui S, Zhong W, Lee C (2014) A critical review of recent progress inmid-range wireless power transfer. IEEE Trans Power Electron 29(9):4500-4511

Analysis and design of a Class D rectifier for a Class E driven wireless power transfer system. ... is demonstrated by a design case for a resonant inductive link driven by a Class E inverter ...

Abstract: This paper proposes a wireless power transfer (WPT) system using the load-independent inverse class-E oscillator. The proposed system realizes autonomous operation without using external driving circuits. Therefore, it is easier to design the power-transmission inverter at high frequencies, in particular.

This paper presents a complete design methodology of a Class-E inverter for capacitive wireless power transfer (CWPT) applications, focusing on the capacitance coupling influence. The CWPT has been investigated in this paper, because most of the literature refers to inductive power transfer (IWPT). However, CWPT in perspective can result in lower cost and ...

Class-E inverter, which is assumed as an ideal exciter for wireless power transfer system due to their low power losses and suitability for high-frequency operation, can operate under the proper ...

1 Introduction. Due to the advantages of high working frequency, high efficiency, circuit simplicity and little volume, a Class E resonant inverter have been applied in many areas such as DC-DC converter [], electronic ballast [], wireless power transfer [-] and high-power factor inverter [].The Class E inverter can be constructed of a single-switching transistor, which ...

The class- E2 WPT system designed by the proposed design procedure achieves high dc-to-dc efficiency at low coupling coefficient, in particular, compared with thosedesigned by the previous design strategies. This paper presents a design procedure of high-frequency loosely inductive coupled wireless power transfer (LIC-WPT) system based on class- E2 dc-dc converter, taking ...

characterization of a 13.56 MHz inductive coupling wireless power transfer (WPT) system based on a class E inverter. The main benefit of a class E WPT system is the small amount of components needed while

achieving good efficiency. An analytical model of the system is proposed and a new design method is reported.

Abstract: Wireless power transfer allows electrical power to be transferred between a source and a load without the need for physical contact. This includes three parts: DC to AC conversion, ...

This paper presents a resonant inductive coupling wireless power transfer (RIC-WPT) system with a class-DE and class-E rectifier along with its analytical design procedure. By using the class-DE inverter as a transmitter and the class-E rectifier as a receiver, the designed WPT system can achieve a high power-conversion efficiency because of the class-E ZVS/ZDS conditions ...

Received: 26 October 2021 Revised: 23 December 2021 Accepted: 25 January 2022 IET Power Electronics DOI: 10.1049/pel2.12256 ORIGINAL RESEARCH Load-independent inverse class-E ZVS inverter and its application to wireless power transfer systems Ayano Komanaka1 Wenqi Zhu1 Xiuqin Wei2 Kien Nguyen1 Hiroo Sekiya1 1 Graduate School of Science and ...

Class-E power amplifier design for wireless power transfer Air Fuel resonant wireless charging overview Tight coupling is defined as a coupling factor "k" greater than 0.5. In wireless charging the coupling is loose with k typically less than 0.1. The mutual inductance between the two coils is given by: = [H] [1]

to adapt to variations in range for a Class E inverter used as a coil driver in a wireless power transfer (WPT) system based on inductive coupling. It is shown that by controlling the duty cycle of the inverter"s switch and the value of its DC-feed ...

This paper proposes a high-frequency multiple-receiver wireless power transfer (WPT) system with a load-independent class-E/F inverter. Each receiver has a post-regulator, which changes the equivalent resistance seen from the inverter to obtain the necessary power for output voltage regulation.

This paper presents the design of capacitive wireless power transfer systems based on a Class-E inverter approach. The main reason for adopting the Class-E inverter approach is because of its high ...

The topology of the ECPT system based on class E amplifier studied in this paper is shown in ... (2024). Design of Wireless Power Transfer System for Mobile Devices Based on Class E Amplifier. In: Cai, C., Qu, X., Mai, R., Zhang, P., Chai, W., Wu, S. (eds) The Proceedings of 2023 International Conference on Wireless Power Transfer (ICWPT2023). ...

This study presents the design of capacitive wireless power transfer systems based on a suboptimal Class-E 2 converter approach. The main reason for selecting the suboptimal Class-E 2 converter is due to its ability of maintaining its high efficiency over a wide bandwidth of operation frequency. However, Class-E 2 converters in general are sensitive to its load"s ...

Design of wireless power transfer system with class e oinverter

This paper presents a design procedure of high-frequency loosely inductive coupled wireless power transfer (LIC-WPT) system based on class-E2 DC-DC converter, taking into account the power loss ...

The purpose of this document is to provide a comprehensive guide to the design of a class-E RF power amplifier for magnetic resonance wireless charging based on the Air Fuel baseline ...

This paper proposes a load-independent inverse class-E zero-voltage switching (ZVS) inverter. The proposed inverter achieves the constant output current and the ZVS at any load resistance ...

By using the class-E inverter as a transmitter and the class-DE rectifier as a receiver, the designed WPT system can achieve a high power-delivery efficiency because of the class-E ...

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