Resonant capacitor grouping

What characteristics are required in resonance capacitors?
The following types of characteristics are required in resonance capacitors which are used in the LLC capacitors of onboard chargers. Since the resonance capacitors are used in resonance circuits, it is extremely important that the capacitance change caused by temperature fluctuations is small.

How does a series resonant capacitor work?
It utilizes the series resonant capacitor as an integrator of the input current,thus cycle-by-cycle input charge is directly controlled without current sensing. As a result,very fast dynamic performance is achieved in all operating conditions with a simple first order compensator.

Why is the capacitance change of a resonance capacitor small?
Since the resonance capacitors are used in resonance circuits,it is extremely important that the capacitance change caused by temperature fluctuationsis small. LLC converters are power supplies appropriate for use with relatively high power.

How do resonant capacitors affect total loss?
Vin = 280 V,Vo = 12 V,Fs = 100 kHz. Output current is exactly 50 A. current is almost the same. These trends show that the designs with larger Design No. (or higher resonant capacitor value) have lower RMS current and magnetic flux swing at the optimization point (nominal input voltage,50% load),thus have lower total loss.

Can resonant frequency be used to design an LLC converter?
It is recognized that some designers prefer specifying the resonant frequency instead of the minimum switching frequency. In this section,characteristics of the design results are explored,and the design results can be used to design an LLC converter with a specified resonant frequency.

Why do resonant capacitors have lower RMS current?
These trends show that the designs with larger Design No. (or higher resonant capacitor value) have lower RMS current and magnetic flux swing at the optimization point (nominal input voltage,50% load),thus have lower total loss. The reduced RMS current is mainly due to the increased Lp value which decreases the primary-side circulating current.

Capacitive coupling increases the converter& #x2019;s power density and offers better repeatability of the reactive network by eliminating one magnetic element and reducing its inherent parametric variation. In this context, capacitors are the key element in the capacitive-coupled dc/dc converter, such that resonant topologies can be seen as inherent capacitive ...

This study proposes a novel approach for selecting the resonance capacitance of wireless power transfer systems, aiming to achieve a zero phase angle (ZPA) while simultaneously minimizing the leakage magnetic

field.

We begin by comparing the input impedance of a single 1 nF capacitor vs. the impedance of multiple capacitors of the same value. 2. Resonance - Single Capacitor vs. Multiple Capacitors of the Same Value. Consider a network consisting of a 1 nF capacitor with a circuit parasitic inductance of 2.4 nH, and a parasitic resistance of 0.1 ?.

In resonant circuits, capacitors are key components as they resonate with coils. The resonant frequency is expressed by f=1/ (2??LC). Therefore, changes in capacitance due to temperature variations can lead to fluctuations in the resonant frequency, ...

DOI: 10.1109/TPEL.2019.2944835 Corpus ID: 208837846; A Novel Current Sharing Method by Grouping Transformer"s Secondary Windings for a Multiphase LLC Resonant Converter @article{Yang2020ANC, title={A Novel Current Sharing Method by Grouping Transformer"s Secondary Windings for a Multiphase LLC Resonant Converter}, author={Yugang Yang and ...

Section III discusses transformation of a given design into an equivalent design with an arbitrary resonant frequency. Section IV provides a design flowchart to utilize the proposed algorithm to design LLC converters. Section V demonstrates ex-perimental results of a prototype LLC converter designed using the proposed algorithm.

Therefore, taking into account the operation principle of the well-known transformer-based dc/dc converters, the paper clusters the main topologies (in particular DAB and CLLC converters) into two groups (resonant and non-resonant) to define the main design aspects of capacitive-coupled converters: capacitance values, resonant tank arrangement ...

Paralleling of two LLC resonant converters leads to a significant reduction of current stress in the output filter capacitor, provided that the driving signals of both converters are of equal ...

The approach of the multi-resonant converter has been proposed to eliminate the drawbacks of the QRCs. The technique of achieving ZVS can be obtained by utilizing two ...

(single-pole) circuit and a dual-resonance (double-pole) capacitor charging system. Design equations are derived from the solutions. As an example, a command charging system for a capacitor is ...

Abstract: The dependences of the charging time of the capacitive energy storage device to the specified voltage and power of the inverter high-voltage transformer-less resonant charger of ...

r2 resonant inductor (Phase 1& 2) 58 uH/64 uH(?10%) C r1/C 2 resonant capacitor (Phase 1 and 2) 47 nF/52 nF (?10%) L m1/L m2 magnetizing inductor (Phase 1 and 2) 0.571 mH/0.569 mH f s Switching frequency 80-100 kHz of the two methods. The parameter design in Table 1 was obtained based on the design tools

provided by MPS and the

A novel current sharing method for a multiphase LLC resonant converter is proposed in this article. Without additional components or control strategies, the proposed method can achieve good current sharing performance even with 10% tolerance of the resonant parameters. Besides, the proposed method is very simple; only the secondary windings of the transformers need to ...

adding dc blocking capacitors or ying capacitors increase the cost. The input voltage of each phase is reduced, resulting in an uneven switch stress, which makes the thermal design complicated. Automatic current sharing for multi-phase resonant con-verters by matching the input impedance of each phase is pre-sented in [14]. A relatively simple current sharing method by ...

Therefore, taking into account the operation principle of the well-known transformer-based dc/dc converters, the paper clusters the main topologies (in particular DAB ...

DOI: 10.1109/APEC.2016.7468189 Corpus ID: 23036935; A common capacitor multi-phase LLC resonant converter @article{Wang2016ACC, title={A common capacitor multi-phase LLC resonant converter}, author={Hongliang Wang and Yang Chen and Zhiyuan Hu and Laili Wang and Ya-jie Qiu and Wenbo Liu and Yanfei Liu and Jahangir Afsharian and Zhihua ...

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