High current modular resonant capacitor

What is a high power resonance capacitor?

High-power resonance capacitors are an important component in magnetic resonance using wireless power transfer EV charging systems. This is because a high-accuracy resonance circuit with high withstand voltage is required for quick,efficient wireless transfer of a large amount of power.

Why do LLC converters need a resonance capacitor?

Therefore, the resonance capacitor requires superior characteristics. Since LLC converters have a PFM power supply which uses LC resonance, transformers and resonance capacitors are both extremely important components.

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.

Can augmenting inductor resonantly charge/discharge all flying capacitors at different resonances?

The augmenting inductor can resonantly charge/discharge all flying capacitors at different resonances,thereby facilitating soft-charging and soft-switching operation. Based upon this concept,an 8-to-1 Multi-Resonant-Doubler (MRD) converter and a 6-to-1 Cascaded Series-Parallel (CaSP) converter are proposed and analyzed.

What is a multi-resonant switched-capacitor (SC) converter?

At 48-to-8 V conversion,the prototype achieves 99.0% peak efficiency (98.5% including gate drive loss) and 2230 W/in 3 power density. This article presents a family of resonant switched-capacitor (SC) converters with multiple operating phases,herein named "Multi-Resonant SC Converter".

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.

A novel quasi-resonant bridge modular switched-capacitor converter (BMSCC) is proposed in the paper. The main merit is that its resonant circuit has high stability and simplicity, resulting from the employment of the stray inductance distributed in the circuit as a collective resonant inductor. Accordingly, the current spike during switching operation is removed due to ...

and the consequent current stress on the rectifier switches makes the large step-ratio conversion difficult. Lastly, the resonant current ripples on both sides of the dc-links need extra capacitors to smooth the dc

voltage. To overcome all of these problems, two approaches of isolated resonant modular multilevel converter (IRMMC) are

A novel quasi-resonant bridge modular switched-capacitor converter (BMSCC) is proposed in the paper. The main merit is that its resonant circuit has high stability and simplicity, resulting from ...

Increasing needs for smaller form factor electronic systems motivate higher integration of power management circuits. This has led to growing interest in high-frequency DC-DC converters with smaller passive components [1] -[6]. Even though hybrid or resonant switched capacitor (ReSC) converters show promise, full integration of inductors remains challenging. At frequencies ...

Because the output current of the high frequency resonant capacitor charger has current zero-crossing point [10], a RC parallel branch with a capacitance of 159 uF and a resistance of 4 k? is ...

example of using the resonant switched-capacitor concept to achieve a small form factor as well as soft-switching of a switched-capacitor converter. The switched-tank converter (STC) shown in Fig. 2 is derived from the modular multilevel resonant DC-DC converter (MMRC) shown in [37]. And the zero-current switching (ZCS) operation and design ...

Resonant switched-capacitors converters (ReSCCs) are becoming an attractive alternative to traditional buck converters in volume-constrained and high-conversion-ratio applications, thanks to their superior efficiency and power density. This work presents a new ReSCC topology derived from an interleaved ladder structure, which performs a nominal 4:1 ...

multi-winding current-ballasting in high-frequency coupled mag-netic structures for direct-conversion resonant switched-capacitor (ReSC) DC-DC converters, a technique that can mitigate AC con-duction losses, improving efficiency at high frequency. While past work has explored merged-LC resonators which combine capaci-

This paper presents a quasi-resonant technique for multilevel modular switched-capacitor dc-dc converter (MMSCC) to achieve zero-current switching (ZCS) without increasing cost and sacrificing ...

500 kW Resonant Switched-Capacitor Converter for 1600 V Electric Trucks and Electric Aircraft Powertrain Application ... An effective high-power testing method has also ...

that can be suitable for a modular high-voltage DC/DC converter. A modular resonant converter with three half-bridge resonant circuit cells is presented in this paper. Three resonant converters are connected at primary-series and secondary-parallel to reduce the voltage and current stresses at the primary and secondary sides.

ABSTRACT This paper demonstrates a high-efficiency modular multilevel resonant DC-DC converter

(MMRC) with zero-voltage switching (ZVS) capability. In order to minimize the conduction loss in the

fer method between capacitors to achieve high efficiency and density operation by adding a small resonant inductor in series to pure switched-capacitor converter"s (SCC) flying ca-pacitor. By operating switching frequency to be the same as its resonant frequency, RSCC ... 3.12 STC"s capacitor current with Missmatched Resonant Tank ...

A novel quasi-resonant bridge modular switched-capacitor converter (BMSCC) is proposed in the paper. ... The new method can reduce the high pulse current which usually causes serious problem in ...

Multilevel modular resonant switched-capacitor converter can achieve either zero-current switching (ZCS) or zero-voltage switching (ZVS) by utilizing different converter control strategies. This paper presents a comprehensive way to compare the root mean square (RMS) value of current flowing through switching devices in both ZCS operation and ZVS ...

Figure 2.1 shows the circuit configuration of the proposed m + n + 1-level ZCS RSC converter, which consists of a half bridge Q p and Q n, and m + n modular cells. The modular cell is shown in the dashed box in Fig. 2.1, which is composed of two diodes D pn1 and D pn2, a filter capacitor C pon, a resonant capacitor C pn, and a resonant inductor L pn.

Web: https://doubletime.es