Series-parallel capacitors for voltage boost

What is two-phase series capacitor (SC) boost converter?
The two-phase series capacitor (SC) Boost converter is proposed in . By adding a capacitor to the adjacent phase in traditional two-phase parallel converter, automatic current-sharing can be realized in the limited duty cycle range of 0.5 to 1.

How can a three series capacitor be used as a current sharing strategy?
Applying the charge balance principle for three times,through the three series capacitors,the current sharing strategy can be obtained. Then applying the inductor volt-second balance to get the constraint conditions of the four times voltage gain.

How can a capacitor share a current in a steady state?
In a steady state,the total charge through the capacitor is equal to 0 in a switch period. Because of coupling capacitors in phases,the shared-current in phases can be realized through the charge balance principlefor several times. Fig. 2 shows the current sharing principle mainly adopted in this paper.

Why do multiphase parallel converters have high switching and conduction losses?
But high switching and conduction losses are caused by the imbalanced current in phases,which is due to some unavoidable factors,even disrupt the operation. So current sharing is an inevitable problem for multiphase parallel converter.

How to determine the charge balance of a phase-K series capacitor?
It can be observed that in any operating mode,the charge balance of the phase-K series capacitor is only determined by the current through the phase-1 to phase-K +1 phase,in which the current of phase-1 to phase-k act on the capacitor for charging and the current of phase-K +1 acts on discharging.

Is current sharing a problem for multiphase parallel converter?
So current sharing is an inevitable problemfor multiphase parallel converter. To achieve this,sensors and other auxiliary elements are added in phases,and some advanced control techniques are employed ,.

resonant-switched-capacitor boost converters with a Linear Ex-tendable Group Operated Boost (LEGO-Boost) architecture. In the LEGO-Boost architecture, multiple resonant voltage doubler ...

The additional boost capacitor could be series or parallel connected to the dc-link capacitor to produce proper excitation and demagnetization voltage. The proposed active boost converter ...

This letter presents a novel single-phase 13-level (13L) single-source switched capacitor multilevel inverter ($$hbox {S}^3$$ S 3 CMLI) topology with a sextuple voltage ...

of seven rational VCRs to boost an input voltage of 0.25-1 V to a 1-V output. Delivering a maximum loading power of 20.4 mW, ... power density, rational, series-parallel (SP), switched ...

This article presents an algebraic series-parallel (ASP) topology for fully integrated switched-capacitor (SC) dc-dc boost converters with flexible fractional voltage ...

Connecting two identical capacitors in series, each with voltage threshold v and capacitance c, will result into a combined capacitance of 1/2 c and voltage threshold of 2 v.. ...

An algebraic series-parallel (ASP) topology for fully integrated switched-capacitor (SC) dc-dc boost converters with flexible fractional voltage conversion ratios (VCRs) can ...

Inspired by the advantages of multiphase series capacitor boost converter, its automatic current sharing and N-times gain control strategy is proposed and investigated. ...

This paper presents a modified topology, as shown in Figure 2, for the boost series and parallel converter to increase its conversion rate by reconfiguring capacitor ...

5 ???· This paper proposes a novel small film capacitor based bidirectional DC/DC converter (BDC) for the hybrid energy source systems (HESS) in electric vehicles (EVs). In the proposed ...

Figure (PageIndex{2})(a) shows a parallel connection of three capacitors with a voltage applied. Here the total capacitance is easier to find than in the series case. To find the equivalent total capacitance (C_{mathrm{p}}), we first note ...

I have only seen it done to increase voltage. On some power supply front-ends (AC/DC conversion) with a voltage doubler the capacitors are in parallel at low voltage and in ...

when two capacitors are in series, choose incorrect a) same charge is delivered for both b) smaller the capacitor value, higher the voltage across it c) lager the capacitor value higher the ...

This study introduces a new boost-type multilevel inverter named the "nine-level switched capacitor-high-voltage gain boosting inverter" (9LSC-HVGBI). Notably, this specific ...

Abstract: An input-parallel, output-series dc-dc Boost converter with a wide input voltage range is proposed in this paper. An interleaved structure is adopted in the input ...

The proposed design is grounded in an intelligent series and parallel connection of switched capacitors. The study explores the operational concepts, with a specific focus on ...

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Abstract--This article presents an algebraic series-parallel (ASP) topology for fully integrated switched-capacitor (SC) dc-dc boost converters with flexible fractional voltage conver-sion ...

DC-DC converters with voltage boost capability are widely used in a large number of power conversion applications, from fraction-of-volt to tens of thousands of volts at ...

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