

Does a series-capacitor Buck-type converter have a closed-loop control scheme?

Abstract: This paper explores the large-signal and small-signal dynamics of a series-capacitor (SC) buck-type converter and introduces an optimal closed-loop control scheme to accommodate both the steady-state and transient modes.

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.

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 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 principle for several times. Fig. 2 shows the current sharing principle mainly adopted in this paper.

How does a SC-buck converter work?

The new control method merges a voltage-mode controller for the steady-state operation and a nonlinear, state-plane based transient-mode controller for load transients. A detailed principle of the operation of the SC-buck converter is provided and explained through an average-behavioral model and state-plane analysis.

What is the control method of multiphase parallel converter?

Generally, the control method of multiphase parallel converter is the traditional average phase shift control, that is, each phase adopts the same switch frequency and duty cycle, and each phase is evenly displaced with $2\pi/N$ phase-shifted.

Closed-Loop Design and Transient-Mode Control for a Series-Capacitor Buck Converter. Timur Vekslender. 2019, IEEE Transactions on Power Electronics. See full PDF download [Download ...](#)

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This paper introduces an optimal closed-loop control scheme to accommodate both the steady-state and transient modes of a series-capacitor buck-type converter and ...

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This paper explores the large-signal and small-signal dynamics of a series-capacitor (SC) buck-type converter and introduces an optimal closed-loop control scheme to accommodate both ...

Step-down converters based on the switched-capacitors; (a) 2-to-1, (b) series-parallel (4-to-1), (c) Dickson (4-to-1), (d) Fibonacci (5-to-1), (e) ladder (4-to-1) and ...

In, a switched capacitor series voltage controller (SCSVC) is proposed for voltage regulation and protection, and in, a series voltage regulator (SVR) is proposed for DC ...

The dc-dc multiphase series-capacitor (SC) buck converter is a promising single-stage candidate for efficiently stepping-down the increasingly common 48 V rack-level distribution bus voltage ...

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 explores the large-signal and smallsignal dynamics of a series-capacitor (SC) buck-type converter and introduces an optimal closed-loop control schem

Closed-loop design and time-optimal control for a series-capacitor buck converter Yevgeny Bezdenezhnykh 2016, 2016 IEEE Applied Power Electronics Conference and Exposition (APEC)

1 Introduction. In the last three decades, the increasing prices of conventional fossil fuels and changes in global warming and environmental pollution have led to increased ...

signal dynamics of a series-capacitor (SC) buck-type converter and introduces an optimal closed-loop control scheme to accommodate both the steady-state and transient modes. As opposed ...

sharing between the Series Capacitor cells is achieved, when the current controlled cells are referenced by the actual current of the 1st one. The proposal is theoretically analysed and ...

Concerning the control algorithm challenges of this converter family, the authors in [25] present the optimal steady-state and transient mode control of the series capacitor buck ...

Closed-loop design and time-optimal control for a series-capacitor buck converter Yevgeny Bezdenezhnykh 2016, 2016 IEEE Applied Power Electronics ...

1. A multiphase series capacitor direct current to direct current (DC-DC) converter, comprising: a power stage

circuit configured to convert an input direct-current (DC) ...

This paper compares controlled series capacitor (CSC) converters applied to generator-sets used in series hybrid electric vehicles (SHEV). The operation of each circuit is discussed and...

The proposed control strategy is applied in 4-phase series capacitor Boost converter for CCM operation for duty cycle 0 to 1. Without any additional sensors or other ...

This paper presents control methods that achieve DC-link capacitor voltage balance of a series half bridge (SHB) LLC resonant converter operating at different modulation ...

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