

Abstract--ferroelectric capacitor This paper presents a reconfigurable on-chip switched capacitor (SC) voltage converter aimed at ultra-low- power (ULP) applications. The proposed voltage...

In this paper, the capacitor Charge Balance Control (CBC) method is used to improve the dynamic performance of the DC power generation system. According to the different control objectives and control methods, we have classical CBC strategy, voltage closed-loop Optimal PI Control (OPIC) strategy based on the CBC principle, and capacitor energy storage closed-loop ...

By contrast, the dynamic capacitor charging methods utilize large-volume high-voltage capacitors as the load. The output I-V curves can be obtained during the process of the capacitor charging, because the terminal voltage of the capacitors will not be changed abruptly and it will gradually rise with the increase of charges. The capacitor charging based I-V ...

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In short, a constant current source offers the most energy efficient way to charge a RC system to certain energy level within a fixed time. Replacing the abrupt voltage switching by linear voltage ramp using a constant current avoids the current surge suffered by systems charged by constant voltage sources. The analysis presented in ...

In this brief, we present an energy efficient capacitor charging technique called split-capacitor charging, which charges a capacitor array in a step-wise fashion. Circuit ...

Split-capacitor charging is proved to reduce the energy loss during the sleep-to-active transition by 66%. An existing symmetric energy recycling technique recovers 75% of the energy from the capacitor bank at the expense of a large-output voltage ripple. In this paper, an improved method called asymmetric energy recycling reconfiguration (s ...

This paper presents a technique to enhance the charging time and efficiency of an energy storage capacitor that is directly charged by an energy harvester from cold start-up based on the open-circuit voltage (VOC) of the energy harvester.

In this paper, we present an energy efficient capacitor charging technique called split-capacitor charging, which charges a capacitor array in a step-wise fashion. Circuit ...

# Capacitor charging energy conversion method

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The predominant concern in contemporary daily life revolves around energy production and optimizing its utilization. Energy storage systems have emerged as the paramount solution for harnessing produced energies efficiently and preserving them for subsequent usage. This chapter aims to provide readers with a comprehensive understanding of the &quot;Introduction ...

In this paper, we propose the stepwise charging of a capacitor by consecutively changing the duty ratio of the DC-DC down converter. In N step charging, the energy dissipation is reduced to one Nth when compared with the conventional direct charging.

In this paper, charging capacitor in RC circuit, to a final voltage, via arbitrary number of steps, is investigated and analyzed both theoretically and experi-mentally. The ...

Effective energy management is essential to enable triboelectric nanogenerators for realistic applications. Here, the authors optimize TENG and switch configurations to improve energy conversion ...

In this paper, charging capacitor in RC circuit, to a final voltage, via arbitrary number of steps, is investigated and analyzed both theoretically and experi-mentally. The obtained results show that the stored energy in the capacitor is constant independent of N, but the dissipated energy in the resistor and the

Energy considerations. When the capacitor is fully charged, the current has dropped to zero, the potential difference across its plates is (V) (the EMF of the battery), and the energy stored in the capacitor (see Section 5.10) is ...

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