

Adaptive Discharge Time Control for Battery Operation Time Enhancement

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Abstract : This paper proposes an adaptive discharge time control method to balance cell voltages in alternating battery cell discharging method. In the alternating battery cell discharging method, battery cells are periodically discharged in turn. Recovery effect increases battery output voltage while the given battery cell rests without discharging, thus battery operation time of target system increases. However, voltage mismatch between cells leads two problems. First, voltage difference between cells induces inter-cell current with wasted power. Second, it degrades battery operation time, since system stops when any cell reaches to the minimum system operation voltage. To solve this problem, the proposed method adaptively controls cell discharge time to equalize both cell voltages. In the proposed method, battery operation time increases about 19%, while alternating battery cell discharging method shows about 7% improvement.

Keywords : battery, recovery effect, low-power, alternating battery cell discharging, adaptive discharge time control

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