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A single LC tank based active voltage balancing circuit for battery management system (Article)

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Abstract

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Nowadays, Battery operated vehicles and power tools are becoming popular due to their simple construction, compact structure, low operating and maintenance cost, moreover renewable energy utilization facility. A single series resonant active converter has been designed to balance the voltage level of electrical energy storage device (ESD). To obtain the necessary operating voltage and current, many electric cells are combined together in series and parallel. A series battery balancing circuit can be used to improve the efficiency of each cell charging and discharging process and consequently increase the lifespan of the battery. A battery management system (BMS) needs an efficient balancing circuit. This paper presents a high-speed single LC - tank DC to DC converter for electric cell balancing scheme. In this research, two 2s LiPo battery has been used as energy storage device. The proposed voltage balancing circuit works by charging and discharging the charge storage device through a single series LC - tank circuit. Experimental results show that the proposed balancing circuit can make 0 voltage difference from 800 mV, in 285 seconds and it is less time than the current system. © 2018 International Islamic University Malaysia-IIUM.

Author keywords

Battery management system Electric vehicles Electrical energy storage device Resonant converters Voltage balancing

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