

Constant Voltage Battery Pack *Integrates High Performance DC to DC Converter, Active Cell Balancer and Charger*

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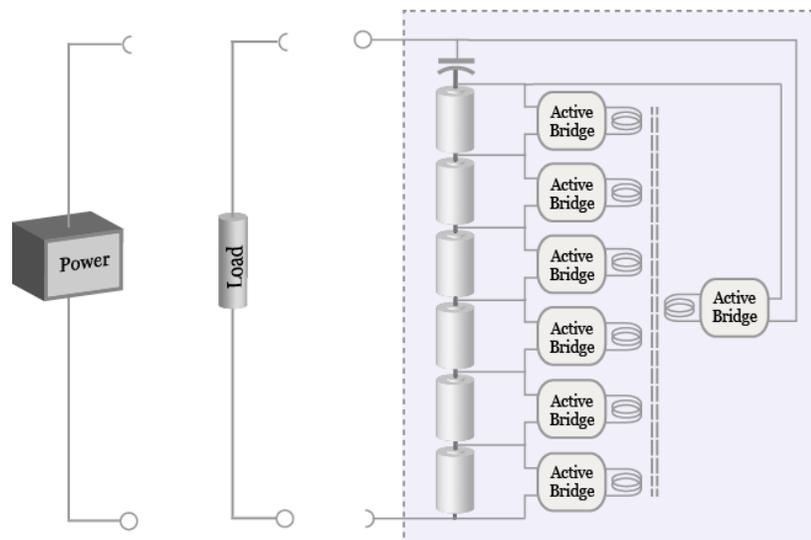


Figure 1: A novel architecture for large battery packs integrates active cell balancing, DC to DC conversion and pack/cell charging into the same circuit

Active cell balancing during all stages of operation of a large battery pack extends the life of cells and maximizes the energy and power delivery during each cycle. The benefit is smaller and less expensive battery packs. When the same circuitry provides a 95.4% peak efficiency DC/DC converter which acts also as a charger, the result is a Constant Voltage Battery Pack, ready to be connected to any vehicle or grid power storage application.

The active balancer in this implementation manages how much power it draws from each individual cell and is capable of charging specific cells even while the rest of the

battery pack is discharging. This novel system was prototyped at the Laboratory for “Power Management and Integrated Switch-mode Power Supplies” at the University of Toronto, under the guidance of Prof. Aleks Prodic. A US patent was issued, adding to the Sendyne’s portfolio patents on cell balancing. Sendyne will make the technology available for licensing to interested parties.

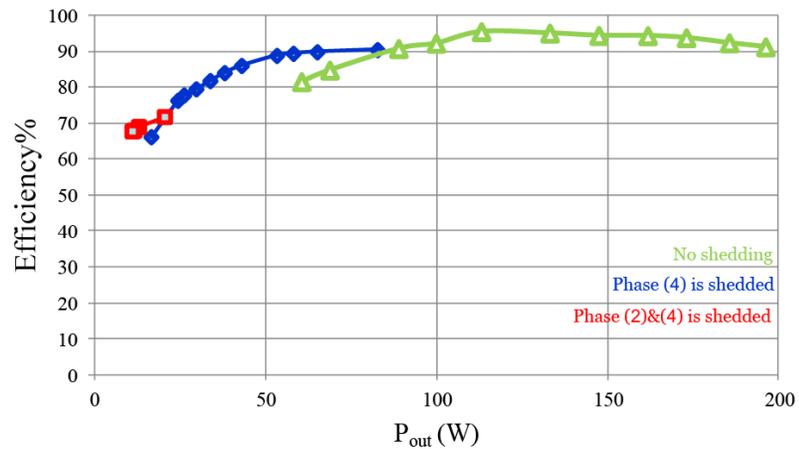


Figure 2: Power processing efficiency experimental results

Abstract: What is described is a battery management architecture that eliminates previously described problems of the previous solutions and compensates for the extra cost of a cell-balancing circuit. These advantages are achieved by integrating the voltage step-up and balancing functions as well as charging functions inside a single converter topology. Instead of providing the entire output voltage and power, the converter in this configuration is merely assisting the battery by providing a portion of the power delivered to the load, rather than the entirety of the power delivered to the load. This portion of power is proportional to the difference between the output and the battery pack voltages.

References

Assisting converter, US Patent 8,779,700 B1, Original Assignee: Sendyne Corp.