

One of the cells in the lithium battery pack has a higher voltage

Why is a lithium battery pack designed with multiple cells in series?

Contributed Commentary by Anton Beck, Battery Product Manager, Epec When a lithium battery pack is designed using multiple cells in series, it is very important to design the electronic features to continually balance the cell voltages. This is not only for the performance of the battery pack, but also for optimal life cycles.

What is lithium battery imbalancing?

Lithium battery cells imbalancing occurs when individual cells in a battery pack exhibit varying states of charge, capacity, or voltage. This discrepancy can compromise the battery's overall performance and safety. For instance: Variations in capacity and impedance create uneven cell currents, generating heat and temperature gradients.

How does voltage affect the performance of lithium-ion batteries?

Voltage significantly impacts the performance of devices that use lithium-ion batteries. Voltage refers to the electrical potential that drives the flow of current in a circuit. In lithium-ion batteries, the nominal voltage typically ranges from 3.2 to 3.7 volts per cell. When voltage levels are optimal, devices operate efficiently and safely.

Why do lithium ion cells have a low battery capacity?

Furthermore, initial variations of the capacity and impedance of state of the art lithium-ion cells play a rather minor role in the utilization of a battery pack, due to a decrease of the relative variance of cell blocks with cells connected in parallel.

What is the nominal voltage of a battery pack?

The nominal voltage of the final set of cells is the number of cells in series times the nominal voltage of a single cell. If we look at the battery packs out there we can see that they cover the range of nominal voltages from 3.2V to 820V in the graph (plotted from the Battery Pack Database).

What voltage does a lithium ion battery use?

This voltage range is crucial for the battery's performance and longevity. The U.S. Department of Energy states that lithium-ion batteries commonly operate at a nominal voltage of 3.7 volts per cell, an industry standard based on their chemical composition.

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for understanding how different lithium-ion batteries perform ...

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