Fast Charging of High Energy Li-ion Battery with Integrated Passive Thermal Management

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ABSTRACT:
With emerging trends in transportation electrification, fast charging of high energy Li-ion battery can help to break through the bottleneck of its widespread adoption. Rapid charging 50% of battery capacity within 10-15 minutes, commonly referred to as ‘filling the tank’ experience, could dramatically reduce the vehicle down time as well as the overall battery pack size, especially for fleet vehicles. To date, such fast-charging capability has been limited to high power batteries over narrow a window of operating conditions to avoid premature aging of the battery (mainly due to lithium plating) and safety concerns.

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