

Analysis and Validation of Multi-Device Interleaved DC-DC Boost Converter for Electric Vehicle Applications

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Abstract

In Electric Vehicle (EV) application, the voltage conversion is significant to obtain the desired operating voltage from the source voltage. A conventional boost converter can handle such applications, but it may add losses throughout the conversion process. This work focuses on the design and implementation of a multi device Interleaved DC-DC converter with greater voltage gain, lower voltage stress across the switch, and improved efficiency when compared to the standard Boost converter and conventional Interleaved Converter. The suggested converter has three times the voltage gain of a standard Boost DC-DC converter. These converters are used in applications that demand a constant DC voltage, such as electric vehicles. The proposed converter's mathematical modelling and modes of operation are discussed. The proposed DC-DC converter's feasibility is validated using real-time simulation (OPAL-RT), and the results are presented in detail.

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