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A Novel Design Methodology for a 1.5 KW DC/DC Converter in EV and Hybrid EV Applications

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Abstract : This paper presents a method for the efficient implementation of a unidirectional or bidirectional DC/DC converter. The DC/DC converter is used essentially for energy exchange between the low voltage service battery and a high voltage battery commonly found in Electric Vehicle applications. In these applications, apart from cost, efficiency of design is an important characteristic. A useful way to reduce the size of electronic equipment in the electric vehicles is proposed in this paper. The technique simplifies the mechanical complexity and maximizes the energy usage using the latest converter control techniques. Moreover a bidirectional battery charger for hybrid electric vehicles is also implemented in this paper. Several simulations on the test system have been carried out in Matlab/Simulink environment. The results exemplify the robustness of the proposed design methodology in case of a 1.5 KW DC-DC converter.

Keywords : DC-DC converters, electric vehicles, power electronics, direct current control
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