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Review on power converters for Electric Vehicles

Kondreddy Sreekanth Reddy¹, Dr.Sreenivasappa B V²

1. Research Scholar, IEEE Member Centre for Research in Power Electronics Presidency University, Bengaluru, Karnataka, India

2. Associate Professor, IEEE Member Centre for Research in Power Electronics Presidency University, Bengaluru, Karnataka, India

Abstract

The utmost protuberant concern in the Electric Vehicles (EVs) primarily is the process by which the charging of the batteries should be done and secondly the growing appeal of power required due to the quick demand of electric power necessitated by EVs, Hybrid Electric Vehicles (HEVs) and Plug-in Hybrid Electric Vehicles (PHEVs). There has been a detailed, critical evaluation of converters that are being used for the charging modules of electric vehicles. This paper has enlisted seventeen power converters that are being used within the charging modules of electric vehicles in terms of their features, performance parameters, advantages, disadvantages, circuit complexities and cost. Further it has been illustrated that owing to the simplicity of structure and operational mode, electric vehicles are much more efficient than HEV and PEV. Amongst these seventeen converters, the use of four converters namely Half Bridge LLC (HBLLC), Full Bridge LLC resonant converter (FBLLC), EF2 converter and Full Bridge (FB) converters are gaining popularity. This is due to the fact that these converters have an increased factor of efficiency and improved performance. Therefore a fair conclusion states that the use of FB LLC resonant converter best suited for the charging modules of electric vehicle applications.

Keywords:

Electric vehicle, Bridge converter, Bidirectional converter, Resonant Converter

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