

Modular 11kW bidirectional onboard charger with SiC-MOSFET technology mobile applications

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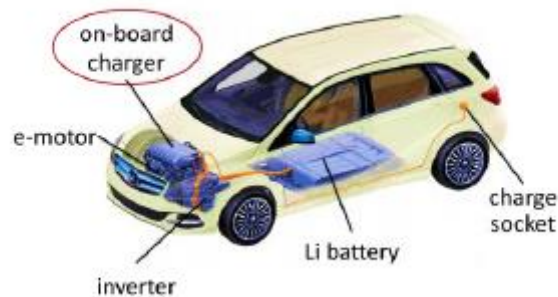
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Abstract—This paper describes a smart grid ready modular and bidirectional onboard charger for extra low voltage mobile applications. The described charger is able to provide 11 kW continuous power with a total efficiency up to 97%. The total power density is 1.7 kW/l and so the charger is suitable for mobile applications in which installation space and weight are critical topics. Additional to the high power density the output voltage of 48 V qualifies the charger to be used in special for applications with high power low voltage drives (e.g. 48V ISCAD Drives), applications with restricted weight or voltage levels (e.g. watercraft, aircraft, chemical or pharmaceutical industry). The paper consists of the purpose of use of the charger, the simulation, the circuit diagram of the separate constituent parts and the final design pattern. It closes with a description of hardware modularity and the bidirectional use in context of modern smart grids and future work.

Keywords—active B6 PFC; modular AC/DC converter; onboard charger; 48 V; automotive; navy; aerospace; ISCAD, smart grid, bidirectional charger



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