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(57) Abstract :

The present invention relates to a Multi-phase Synchronous Buck Converter (100) suitable for the charging stage of an offboard electric vehicle (EV) charger for vehicles. The charging stage power converter (100) requires a 300V dc bus (1) at its input which is generated by the first stage of power conversion. At the output of any converter (100), an electric vehicle (EV) with nominal battery voltages (EVB1, EVB2, ..., EVBn) can get connected to charge its battery at different charging current rate upto 200A, the battery voltage varying between 40V-100V. The calculated value of reference current (5) is equally distributed to all the phases (8). Based on this reference current magnitude and decreasing slope for peak current mode control, time varying references for individual phases are generated inside the digital controller unit (3). These references are phase shifted by $360/N$, where N is number of converters or phases (Cn). At the output a constant dc is produced free of current ripple. Use of peak current mode control (4) also ensures equal loading between the phases and protection against overloading.

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