

Design and Simulation of CCM Boost Converter for Power factor Correction using Variable Duty Cycle Control

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Abstract : Power quality in terms of power factor, THD and precisely regulated output voltage are the major key factors for efficient operation of power electronic converters. This paper presents an easy and effective active wave shaping control scheme for the pulsed input current drawn by the uncontrolled diode bridge rectifier thereby achieving power factor nearer to unity and also satisfying the THD specifications. It also regulates the output DC-bus voltage. CCM boost power factor correction with constant frequency operation features smaller inductor current ripple resulting in low RMS currents on inductor and switch thus leading to low electromagnetic interference. The objective of this work is to develop an active PFC control circuit using CCM boost converter implementing variable duty cycle control. The proposed scheme eliminates inductor current sensing requirements yet offering good performance and satisfactory results for maintaining the power quality. Simulation results have been presented which covers load changes also.

Keywords : CCM Boost converter, Power factor Correction, Total harmonic distortion, Variable Duty Cycle.

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