

Flyback Bridgeless PFC Ac-Dc Converter

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ABSTRACT

Abstract

The flyback bridgeless PFC AC-DC converter can achieve high efficiency and high input power factor. One of the main reason is the components are reducing due to it is a bridgeless converter which means the bridge rectifier from the conventional AC-DC converter is removed. In order to get a good PFC, this converter will be operated in discontinuous conduction mode (DCM). The PFC will reshape the input current same as input voltage which is in sine-wave. In this project, the circuit topology will be tested in Pspice to show that the circuit is working and able to get the result. It is a full wave converter, which is contained positive half-cycle and negative half-cycle. But only positive half-cycle will be analyze since the same method can be carried out in negative half-cycle. By using the method of averaging, the equations with time-domain can be developed from the circuit. Then add the perturbation in the equations to get the linearize equations. So the small signal AC model can be draw out with this linearize equations. Then by using the Matlab Simulink, the small signal model and large signal model can be constructed to test the circuit capability and control the feedback signal. Both of the signals will be changed to mathematic form which is called S-domain. The equations that are going to change to S-domain are from time-domain. It is to develop the transfer function of the circuit. The transfer functions of this project have included line to output transfer function, control to output transfer function and load transfer function. These transfer functions will be placed in small signal model and large signal model where the small signal model is in open loop and large signal model is in close loop. After getting the results from Maltlab Simulink, the results comparison between Pspice and Matlab Simulink can be carried out.