

Design of a PFC rectifier with fast start up response and low input current distortion

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Abstract. For a PFC rectifier, normally designing of the PI compensator is based on the frequency domain model which is derived from the dynamic model of the rectifier, so it cannot guarantee a fast start up response. As the high input current quality and fast start up response are conflicting objectives and with improving one of them, another is degraded, for designing a PI controller which can provide both of them, a Multi-Objective optimization approach can be implemented. In this paper, for the first time, Strength Pareto Evolutionary Algorithm which is based on Pareto Optimality concept is used to gain a fast start up response as well as low input current distortion. In order to validate the proposed PI controller, simulation results are presented.

Key words. Power Factor Correction Rectifier, Boost Converter, Start-up response, Total Harmonic Distortion, Multi-Objective Optimization

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