

Implementation and Design of Fuzzy Controller for High Performance Dc-Dc Boost Converters

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Abstract : This paper discusses the implementation and design of both linear PI and fuzzy controllers for DC-DC boost converters. Design of PI controllers is based on temporal response of closed-loop converters, while fuzzy controllers design is based on heuristic knowledge of boost converters. Linear controller implementation is quite straightforward relying on mathematical models, while fuzzy controller implementation employs one or more artificial intelligences techniques. Comparison between these boost controllers is made in design aspect. Experimental results show that the proposed fuzzy controller system is robust against input voltage and load resistance changing and in respect of start-up transient. Results indicate that fuzzy controller can achieve best control performance concerning faster transient response, steady-state response good stability and accuracy under different operating conditions. Fuzzy controller is more suitable to control boost converters.

Keywords : boost DC-DC converter, fuzzy, PI controllers, power electronics and control system

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