Design and Performance Analysis of a Two Loop Control for a PWM dc-dc Buck Converter

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Abstract

In this paper, a two loop control strategy based on frequency domain measures is proposed for a PWM dc-dc buck converter to regulate the output voltage in the presence of input voltage disturbances and load variations. The parameters of inner PI controller and outer PI controller for a specified phase margin and gain cross over frequency are designed using the proposed algorithm. State space averaging technique is used for the modeling of a PWM dc-dc buck converter. The effectiveness of the proposed control strategy is validated using MATLAB/Simulink software for different input voltages and loads.

Key-Words / Index Term

Two loop control, dc-dc buck converter, frequency domain measures, state space averaging technique

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