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Title: Leveraging eSim for Switched Model Simulation of Control PWM Circuits in DC/DC Power Converters

ABSTRACT:

This paper delves into two prominent modeling techniques for switch mode DC/DC power converters: the average model and the switched model. While the average model involves the continuous scaling of voltages and/or currents, the switched model applies them for a brief fraction of the commutation period. Here, the focus is on the switched model technique and its application in simulating control PWM circuits. The model is developed using eSim simulation software, which offers a versatile platform for circuit simulation and analysis. eSim provides a bridge between theoretical circuit design and practical implementation, enabling designers to streamline the design process and address unforeseen challenges. The modeling and simulation techniques are applied to popular control PWM integrated circuits UC1525 and UC 1846. Various components, including the oscillator, error amplifier, and comparator, are simulated alongside subcircuits. Finally, the effectiveness of the model is confirmed, underscoring its relevance and applicability in real-world scenarios.