

A Soft Switching PWM DC-DC Boost Converter with Increased Efficiency by Using ZVT-ZCT Techniques

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Abstract : In this paper, an improved active snubber cell is proposed on account of soft switching (SS) family of pulse width modulation (PWM) DC-DC converters. The improved snubber cell provides zero-voltage transition (ZVT) turn on and zero-current transition (ZCT) turn off for main switch. The snubber cell decreases EMI noise and operates with SS in a wide range of line and load voltages. Besides, all of the semiconductor devices in the converter operate with SS. There is no additional voltage and current stress on the main devices. Additionally, extra voltage stress does not occur on the auxiliary switch and its current stress is acceptable value. The improved converter has a low cost and simple structure. The theoretical analysis of converter is clarified and the operating states are given in detail. The experimental results of converter are obtained by prototype of 500 W and 100 kHz. It is observed that the experimental results and theoretical analysis of converter are suitable with each other perfectly.

Keywords : active snubber cells, DC-DC converters, zero-voltage transition, zero-current transition

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