

This paper proposes a new isolated single-stage single-switch power-factor-correction (S4 PFC) driver for supplying light-emitting diodes (LEDs) without electrolytic capacitor. In the proposed LED driver, the switch turns on under zero current switching (ZCS) condition. Also, it turns on at a voltage less than its nominal voltage stress, and therefore, the switch capacitive turn-on loss decreases too much extent. The leakage energy is absorbed, so there are no voltage spikes across the switch when the switch turns off. In this paper, operating principles of the proposed driver are discussed, and design considerations are presented. Also, a laboratory prototype for supplying a 21 W/30 V LED module from 220 Vrms/50 Hz ac mains is implemented, and experimental results are presented to verify the theoretical analysis.