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Development of a 20 V-LED driver based on the boost converter using a FPGA module

N. Sulistiyanto, M. Rif´an, O. Setyawati
Electrical Engineering Department
Faculty of Engineering, Brawijaya University
Malang, Indonesia
nnst@ub.ac.id

Abstract— **We present the development of a LED (Light Emitting Diode) driver based on the boost power converter. Several DC to DC converter circuits were modeled using B^{2}SPICE to evaluate their characteristics by varying the components and the duty cycle. The driver´s prototype was realized using a FPGA (Field Programmable Gate Array) module as the switching controller, wherein the simulation using Xilink ISE14.6 and the measurements were successfully performed. The Boost and Cuk converter topologies were investigated to achieve an optimum converter which showed relatively high gain voltage. Duty cycle of 5% up to 25% was required to obtain the driver output voltage of 20V, revealing the efficiency of approximately 90%.**

Keywords— LED driver, power converter, FPGA module, B^{2}SPICE