



**ELIMINATION OF ELECTROLYTIC CAPACITOR IN AC-DC  
SYSTEM OF LED DRIVER**

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## **ABSTRACT**

Nowadays, LED or light-emitting diode is the most efficient way in illumination and lighting system due to the advantages of extremely energy efficiency and operating time compared to conventional lighting. LED's have an outstanding operational life time expectation of up to 10 years of continuous operation or double for an average of 8 hours per day. However, the existence of electrolytic capacitor as storage and smoothing capacitor in the LED driver make it bulky and reduces its lifespan. This is because the characteristic of electrolytic capacitor is acidic wet that can be dried when excessive heating is applied. Electrolytic capacitor is considered as the strongest factor that influence on the hampering life span of LED driver circuit. So, the objective of this project is elimination of electrolytic capacitor in LED driver in order to enhance the operating time. In this paper, a novel circuit of LED driver is proposed using neutral point type buck-boost converter incorporating valley fill circuit, which can reduce the capacitance of smoothing capacitor. Thus, film capacitor can be obtained as a smoothing capacitor instead of electrolytic capacitor. The output waveform, voltage ripple and harmonic are examined. The proposed topology with operating principle will be described in detail. A 80W prototype of LED driver has been built to confirm the validity of the proposal.

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