DC – DC CONVERTER FOR POWER LED LIGHTING

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ABSTRACT

The work presents a novel of power electronic driver for Power LED light. This work with dc converter application to an illumination system that connects a battery as a electrical energy to the driver (DC to Dc converter) and load (Power LED). This topology only used single stage converter as a driver between battery supply and power LED light. Therefore, the developed system will reduces power losses, power consumption and cost. These propose topology is very simple and required a single stage of active power switch. This topology used active converter as a main idea without using the transformer. For the future LED driver developments it has to be to be considered that LEDs can also efficiently be supply by pulsating current. This simplifies the converter, control design and reduce the number of component. A prototype circuit that is designed requirement for input only 3.5V - 6V dc and the output is 20V - 33V dc connected to 12 power LED in 15W. Moreover, when circuit in no load the output voltage maximum is 60V. Experimental result show the functionality of the overall system and prove it to be and effective solution for numerous dc to dc converter application.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Nowadays, light emitting diode (LED) has been regarded as the best choice of environment-friendly lighting sources. They are becoming viable replacements in industrial and commercial lighting applications. LED grows rapidly in lighting market. However, there are significant differences between conventional lighting sources and LEDs in terms of voltage and current operating requirements. This mainly caused by enormous improvement achieved in the technology of light emitting diode (LEDs) in the last year [1]. LED will replace incandescent lamp and fluorescent lamp in the future. The incandescent lamps, widely used in residential lighting, are being abolished in many countries due to its low efficiency [2]. LED driven by DC source in general, so DC -DC converter topologies are discuses which can be adapted to feed a constant current into LED load [3]-[4]. In particular, LEDs required a constant current source from a low DC voltage source, but they must also operate from the AC main. New single power LEDs are designed for an input power of 1W, 3W and 5W and their energy efficiency has already suppressed that of incandescent and halogen bulbs. Like the traditional diodes, the current through LED flows in only one direction. This polarization results in the direct emission of light [5].Also that, some impedance must be placed between the LED light and the voltage source to control the lamp current As high-efficiency ultra-bright white LEDs come down in cost, they are approaching cost parity with conventional mercury vapour, HID quartz metal halide and high/low pressure sodium lighting on a cost per lumen basis.