A PORTABLE RECHARGEABLE BATTERY BOOST CONVERTER FOR LED LIGHTING

This thesis is presented in partial fulfillment for the award the

Bachelor of Electrical Engineering (Hons)

Universiti Teknologi Mara (UiTM)

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SEPTEMBER 2012

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ACKNOWLEDGEMENT

I would like to thank Allah Almighty for blessing me and giving time and strength to complete this thesis. There are number of people who are to be acknowledged. I would like to express my sincere appreciation to my supervisor, Dr. Muhamad Nabil Bin Hidayat for his precious continuous guidance, support and encouragement throughout my study. His idea, suggestion and comments give me the courage to handle this study and formed a valuable part of this thesis. My sincere appreciation also extends to technician staff of laboratory at UiTM for the permission to use laboratory. My appreciation goes to my family, who has been so tolerant and very supportive towards me during all these years. Lastly, thank you to all my friends and others who had given highly cooperation in completing this study.

ABSTRACT

This study presents a portable rechargeable battery with DC to DC converter for power Light Emitting Diodes (LEDs) lighting system. This study is undertaken to develop a LEDs lighting system as a functional primary lighting without connecting to the electric supply. Moreover, the system is design to replace the generator set at the night market. The system uses the rechargeable battery as an electrical energy to the driver (DC to DC converter) and the load (power LEDs). This is a low system whereby the lifetime is very long, easy to use and aims to reduce the cost of maintenance using the generator set. This topology is based on a battery charger and combine with simplifies converter method on the same circuit to reduce the number of the component. A prototype circuit that is designed from input AC source (240V) by using the transformer and bridge rectifier to step down (12V) charge the battery 12VDC. The output load (power LEDs) 16V – 36VDC is controlled by the ballast converter. The results show the functionality of the overall system and prove that the LEDs lighting lasts for more than 6 hours operation by using the system and an effective solution to replace the generator set.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Diesel generator (gensets) is very popular as main power source at the night market. The typical use is to deliver electrical power at place without connection to the power grid. However, the (gensets) has many disadvantages; the diesel fuel will be exhausted. The fossil fuels are such things as diesel oil a "non-renewable" source of energy. The oil produces carbon dioxide (CO_2), causing the greenhouse effect and releasing much waste heat. Besides that, generators engine have a louder sound to generate the electricity, it therefore contributes to global warming.

The effects of diesel oil consumption cause the unpleasant smell; and the place will be dirty. The diesel engine of the generator is more difficult to start particularly in cold weather. Since, the price of the diesel fuel is rising rapidly, and the cost of the installation and maintenance is also higher, efforts are being made throughout the world to find another energy source at the night market which is the portable rechargeable battery with DC to DC converter for power Light Emitting Diodes (LEDs) lighting device.