

LEDS EMERGENCY LIGHTING SYSTEM USING DC-DC BOOST CONVERTER

AHMAD HILKAM BIN JAMALUDIN

FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA

JANUARY 2013

ACKNOWLEDGEMENT

In the name of ALLAH, The Most Gracious and The Most Merciful and The Most Beneficent who has given me strength and ability to complete this project and report. Praise is only for ALLAH for his bounty and blessing upon us.

Big thanks to all people who involve directly or indirectly for their contribution by giving response and assisting during completing this final year project.

May ALLAH bless us

ABSTRACT

This paper presents the emergency lighting system using high intensity light emitting diode (LEDs) driven by the dc-dc boost converter. The objectives are to provide an energy saving, low power consumption and longer durability of emergency light compare to the conventional fluorescent emergency light. The proposed emergency lighting system is a combination of dc-dc boost converter and charger circuits. It is controlled by automatic switch to operate the light when main supply is disrupted. Low voltage application, 6V, 2.8AH lead acid battery is used as the supply voltage to 12V LEDs light. The prototype for LEDs emergency light using boost converter was developed. Experimental results show that the prototype emergency lighting system luminous intensity can reach to 25 lux with 3 meters from the lux meter location and it can reach 4 hours of operation. The prototype is comply with the IEEE std 446-1995 requirement..

CONTENTS

DECLARATION	1
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	ix
LIST OF SYMBOLS AND ABBREVIATION	x
CHAPTER 1	
INTRODUCTION	
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Significant of the Project	3
1.4 Objectives	3
1.5 Scope of Projects	3
1.6 Thesis Organization	4
CHAPTER 2	
LITERATURE REVIEW	
2.1 Introduction	5
2.2 Emergency Lighting System	5
2.3 Types of Light	5
2.4 Battery System	7
2.5 Battery Type	8
2.6 Battery Charger	8
2.7 Lighting Level	9
2.8 IEEE std 446-1995	10

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Emergency lighting system widely use in commercial building as a secondary lighting source when there is power outages in main power supply. The purpose of emergency lighting system is to illuminate the area and provide path to the exit way which normally provided with emergency exit sign. This safety precaution for emergency evacuation is to prevent any unwanted harm or death occurs during the panic circumstances.

As the main supply goes down, emergency lighting system need another type of energy source to get supply power to it. Emergency light build in with internal backup energy storage. There are various type of energy storage can be used to provide power to the system such the solar energy or batteries but battery is the most suitable application as it not depend to the solar irradiance compare to the solar source and it can be used at any time either day or night. During the main power not been interrupted, emergency lighting system use ac source from main supply to constant charge the battery to and let its always ready for the emergency operation mode.

The main important part that need to be consider in designing emergency lighting system are the luminance of the light it can provide, the operation hours and the power consumption of the system. The good emergency light has all of these three factors. The improvement on the luminance and its timeliness operation hours of the emergency lighting system can let it reliable to be implemented to the residential house