

**THERMAL CHARACTERISTIC OF LED IN DIFFERENT DEGREE OF
AMBIENT TEMPERATURE**

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**Final Year Project Report Submitted in
Partial Fulfilment of the Requirement for the
Degree of Bachelor of Sciences (Hons.) Industrial Physics in the
Faculty of Applied Sciences
Universiti Teknologi MARA**

JULY 2013

ACKNOWLEDGEMENT

First of all, I am thankful to Allah for give me encouragement and patient so that I was able to finish this final year project report within the given time. To my supervisor, Assoc. Prof. Md. Zulkifli Abd Majid who had guided to complete my project with his support and patient. I would like to convey my appreciation toward him because of his tolerant, giving his advices and inspired me to give my best in completing this project.

A special thanks to my co-supervisor, Mr. Syed Abdul Mutalib Al Junid whose always give support and guide me during whole time in completing this project.

Last but not least, thanks to my family and friends who always there to give support and advises to me. They also spend their time for listen my problems. Thanks to all, I am being thankful and grateful to have you all.

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ABSTRACT

THERMAL CHARACTERISTIC OF LED IN DIFFERENT DEGREE OF AMBIENT TEMPERATURE

In general, there is only 15-20% of the power transformation of LED to illumination, whereas 80-85% dissipates heat. Therefore, with the implement of high brightness LEDs, the requirement for driving current increased and thus increasing heat dissipation. This is a study on the relationship between the thermal of LED with the temperature of surroundings. The aims of this study are to understand the rôle of thermal design in lighting system, to study the characteristics of thermal lighting system, construct the model for characterize it and analyze the effect of thermal LED in different degree of ambient temperature. Data were obtained via experimental setup during laboratory. The experiment was setup with connected the sensor to detect the amount of heat dissipated by the LED to the Arduino software. The experiment was doing for 3 days to take the different ambient temperature. Data was obtained through the software for every 10 minutes during 24 hours time taken. As a results, the thermal of LED changes with the changes in temperature of surroundings. The thermal LED higher during the hot time that is in the afternoon and reduces when achieves night time. In conclude that, the increase in ambient temperature will give an effect to the LEDs and result in higher junction temperature of LED. The higher temperatures can significantly decrease the light output of LEDs over time and also can reduce its lifetime.

CHAPTER 1

INTRODUCTION

1.1 Background of study

The temperature of a body is a quantity which indicates hot or cold the body is. It is a measure of the thermal energy per particle of matter or radiation. Temperature is measured by a thermometer that calibrated in any of various temperature scales, Celsius, Fahrenheit, Kelvin and others.

Ambient temperature is a term which refers to the temperature in a room, or the temperature of the air surroundings.

Light is a combination of radiant energy or visual sensation. Light always starts on its journey from a light source. Light sources can be usefully classified into three types that are direct or point-like, diffuse, and ambient. The fabled "good light" largely means a balanced mixture of the three. Each type of light source gives a specific characteristic. The three most important characteristics of light are brightness, color, and temperature.

Light therefore, is an electromagnetic radiation visible to human eyes. It is simply a very small part of the electromagnetic spectrum, sandwiched