

**DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG**

FINAL REPORT OF FINAL PROJECT

PROJECT TITLE

**FIRING ANGLE EFFECT IN FULLY CONTROLLED SINGLE PHASE
BRIDGE RECTIFIER**

**DATE:
23 OCTOBER 2005**

NAME OF STUDENT:

**MOHD ARMAN BIN ADNAN 2002443252
WAN AZLAN BIN WAN HASHIM 2002443531**

**SUPERVISOR'S NAME:
MR MOHD AFFANDI BIN SHAFIE**

ACKNOWLEDGEMENT

In the name of Allah S.W.T the Gracious and most Merciful. Syukur Alhamdulillah to Allah that gives to us energy and strength to complete this KEU 380 project successfully. Our sincerest appreciation must be extended to our project supervisor Mr. Affandi bin Shafie. It is because he do the help, guidance and patience during the process of completing this project. Not forgetting to most of our friends that give us the information of this project. Secondly, we owe so much thanks to our parent that have support us no matter what we faces during completing this project.

Information and knowledge is what we lack in our way to achieve gold in our project. and the only way to solve it is by asking someone else who know much more than us. All the useful information that we achieve throughout this project, we use it as much as we can to make us for the best that it can. Thank to everybody that had provided us with information and knowledge.

ABSTRACT

Rectifier is used to convert AC (alternating current) to DC (direct current). It is an important part of constructing power supply. Alternating current (AC) flows in one way, then the other way, continually reversing direction. An AC voltage is continually changing between positive and negative. The rate of changing direction is called the frequency of the AC and it is measured in hertz (Hz) which is the number of forwards-backwards cycles per second.

An AC supply is suitable for powering some devices such as lamps and heaters but almost all electronics circuits require steady DC supply. Direct Current (DC) always flows in the same direction, but it may increase and decrease.

Our project is all about how to control the firing angle in rectifier. One way how to control it's by using thyristor. We cannot control the firing angle if we use the diode. It is an advantage if we use the thyristor because it can control the firing angle. The advantage of full wave bridge is it can conduct in both, positive and negative cycle. We choose Matlab Simulink to show the waveform that we get from the circuit that we design.

We have design the rectifier circuit with and without the capacitor. The capacitor behaves like a filter that make the output waveform become smoother than not using capacitor. This rectifier is designed in basic design to provide ease constructing, troubleshooting, low power and cost.

TABLE OF CONTENTS	PAGE
Acknowledgement	1
Abstract	2
CHAPTER	
1. INTRODUCTION	
1.1 Background	5
1.2 Scope of project	6
1.3 Objective of project	7
2. DIODE	
2.1 What is Diode	8
2.2 Diode Operation	9
2.3 Type of Diode	10
2.4 Diode Application	11
3. THYRISTOR	
3.1 What is Thyristor	17
3.2 Thyristor Operation	18
3.3 Type of Thyristor	19
3.4 Thyristor Application	19
4. RECTIFIER	
4.1 What is Rectifier	21
4.2 Type of Rectifier	21
4.3 Rectifier Application	22
5. CIRCUIT DESIGN AND OPERATIONS	
5.1 Circuit operation	26
5.2 Circuit design	27
5.1.1 Schematic diagrams	27
5.1.2.1 With R	28

CHAPTER 1

INTRODUCTION

1.1 Background

A rectifier is an electrical device, comprising one or more diodes arranged for converting alternating current (AC) to direct current (DC). When just one diode is used to rectify AC (by blocking the negative or positive portion of the waveform) the difference between the term diode and the term rectifier is merely one of usage, e.g. the term rectifier describes a diode that is being used to convert AC to DC. Almost all rectifiers comprise a number of diodes in a specific arrangement for more efficiently converting AC to DC than is possible with just a single diode.