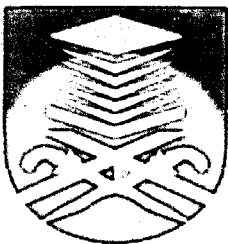


**SINGLE PHASE MATRIX CONVERTER (SPMC) FOR  
BOOST INVERTER OPERATION**

This thesis is presented in partial fulfillment for the award of the Bachelor of  
Electrical Engineering (Honours)

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## ABSTRACT

This paper presents ~~of the work on~~ development of boost DC-AC converter based on the SPMC topology which is known as an advanced topology that could perform many different converter functions. The boost DC-AC converter naturally generates an output AC voltage lower or larger than DC input voltage. A computer simulation model was developing to study the behavior of the proposed converter by using the Power System Block Set (PSB) within the MATLAB/Simulink (MLS) environment. The switching strategy were used that will result in the input source of the SPMC which then converted to the desired output. Based on the duty cycle, the output was synthesized. The basic AC-AC SPMC topology was used as a reference circuit by changing the switching of the driver circuit of IGBT to convert it to boost DC-AC converter. The simulation result of MATLAB/Simulink is presented.

# TABLE OF CONTENTS

Declaration	i
Acknowledgement	ii
Abstract	iii
List of Figures	vi- vii
List of Tables	viii
List of Abbreviation	ix

<b>CHAPTER PAGE</b>	<b>DESCRIPTION</b>	
1	INTRODUCTION	
	1.1 Introduction	1-2
	1.2 Objective	3
	1.3 Scope of the thesis	3
	1.4 Organization of the thesis	4
2	MATRIX CONVERTER	
	2.1 Introduction	5
	2.2 Matrix Converter	6
	2.3 A Boost DC-AC Single Phase Matrix Converter	7-10
3	SWITCHING DEVICES	
	3.1 Introduction	11
	3.2 Switching Choices	11-12
	3.2.1 Power Transistor	12-13
	3.2.2 Metal Silicon Field Effect Transistor (MOSFET)	13-14

# CHAPTER 1

## INTRODUCTION

### 1.1 INTRODUCTION

The applications of solid-state electronics are to control the flow of power by shaping the utility-supplied voltages are known as power electronic. There are many way to study the development of application power electronics in industry and one of them is by using the MATLAB/Simulink software. Before the construction of some application of power electronics begin, modeling and simulation work must done first. This is to ensure there is no problems occur during the real construction. The use of SPMC as a direct changer in [1] is needed as a new technique in order to observe the new strategy in develop the application of power electronics that could perform the high efficiency.

Power electronics is a system that based primarily on the switching of the power semiconductor devices. It is plays an important role in a modern technology such as in heat controls, light controls, motor controls, power supplies and high voltage direct current (HVDC) systems. Converter is one of the industrial applications that extensively used based on the power electronics especially in variable speed drives [2]. Converter can be defining as the controller and conversion system that convert electric power from one form to another form. Normally, there are two types of electrical sources involve in this process which are DC and AC sources.

Converter can form either in single phase circuit or three phase circuit. All the types of circuit have it own advantages. In power electronic, there are four categories of converter was introduced and all the four are describing as below;

- i. **AC to DC Converter** and also known as **Controlled Rectifier**. It is converting from ac input voltage to dc output voltage.