

**UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG**

**ANALYSIS OF EMI NOISE OF
POWER ELECTRONICS
CONVERTER IN PHOTOVOLTAIC
SYSTEM**

MUHAMMAD AKMAL BIN KHANAFEE

FACULTY OF ELECTRICAL ENGINEERING

JULY 2017

ABSTRACT

Three phase inverter is one of method to balancing photovoltaic systems. Therefore, an investigation and design at efficient inverter may assist the system to be implemented efficiently. The consideration of EMI is very important. Entire power electronic device endure with Electromagnetic Interference (EMI). Electromagnetic Interference (EMI) are caused by the fast switching of the power switches and used in modulating the average voltage past a switching period. The electromagnetic interference (EMI) noise has cause systems inefficiency. The supply waveform or source with bunch if this noise will makes the load run improperly. The idea of this project is to reduce Electromagnetic Interference (EMI) from the inverter which is use to convert an output dc produce by photovoltaic source. Total harmonic distortion (THD) produces will reduces system efficiency considering bunch of noise that supply to the load. The electromagnetic interference (EMI) noise has cause In addition; the method used in this paper is the cheapest and affordable by the user. The suggested approach is verified through simulation studies.

ACKNOWLEDGEMENTS

Alhamdulillah. First and foremost, I would like to thank Allah S.W.T. for giving me the time, strength and blessing to finish this study. Without His blessings, none of this is possible. Special appreciation goes to my parent for their love, understanding and unconditional support throughout this long and tough journey.

I would like to express my special gratitude and thanks to my supervisor, Mohd Najib bin Mohd Hussain for his valuable advice, support, ideas and guidance throughout this study.

I would also like to acknowledge the assistance from the technicians and staff at Uitm Permatang Pauh for their continuous help and support during the lab work.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	AUTHOR'S DECLARATION	i
	ABSTRACT	ii
	ACKNOWLEDGEMENT	iii
	TABLE OF CONTENTS	iv
	LIST OF TABLES	vii
	LIST OF FIGURES	viii
	LIST OF SYMBOLS	ix
	LIST OF ABBREVIATION	x
1	INTRODUCTION	
	1.1 Research Background	1
	1.2 Problem Statement	5
	1.3 Objective	5
2	LITERATURE REVIEW	
	2.1 Literature review	6
3	METHODOLOGY	
	3.1 Research Methodology	23
	3.2 Flowchart	24
	3.2.1 Square Wave Injected Into Ni-Elvis Ii Board	25
	3.2.2 Square Wave Observed On Oscilloscope	26
	3.2.3 Rc Configuration	27
	3.2.4 Sinusoidal Wave Observed On Oscilloscope	27

CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Nowadays, solar panels or so called photovoltaic (PV) cells are widely used as power sources. Its converts sunlight towards electricity. There are many invasions in solar generation. The second generation used non-silicon materials such as cadmium telluride as its plate. Then, the third generation which is the latest one made up of mixture of material along with silicon. Solar panels produce direct current yet before entering the grid, the dc currents needed to be convert to Ac currents through inverter[1]. Each photovoltaic cell is essentially a sandwich comprised of two cuts of semi-leading material, as rule silicon a similar stuff utilized as a part of microelectronics. In order to operate, photovoltaic cells need to set up an electric field. Much like an attractive field, which happens due to inverse poles, an electric field happens when inverse charges are isolated. To get this field, makers mixes silicon with different materials, giving each cut of the sandwich a positive or negative electrical charge. In particular, phosphorous was implemented into the top layer of silicon, which includes additional electrons, with a negative charge, to that layer. Furthermore, the base layer gets a measurement of boron, which brings about less electrons, or a positive charge[2] This all indicates an electric field at the intersection between the silicon layers. At that point, when a photon of daylight thumps an electron free, the electric field will drive that electron out of the silicon junction.

A couple of different segments of the cell transform these electrons into usable power. Metal conductive plates on the sides of the cell gather the electrons and exchange them to wires. By then, the electrons can stream like some other wellspring of power[3].