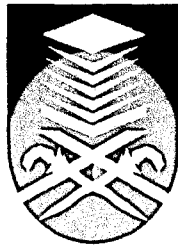


DC / AC PURE SINE WAVE POWER INVERTER

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MOHD AZAM BIN ABD HAMID
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM,
SELANGOR, MALAYSIA

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ABSTRACT

This project focuses on DC to AC power inverters, which aim to efficiently transform a DC power source to a high voltage AC source, similar to power that would be available at an electrical wall outlet. Inverters are used for many applications, as in situations where low voltage DC sources such as batteries, solar panels or fuel cells must be converted so that devices can run off of AC power. To simulate the circuit of the project MATLAB/SIMULINK was used to know the properties of the waveform, output voltage, Total Harmonic Distortion (THD) of the inverter and etc. The microcontroller was used to generate the Pulse Width Modulation (PWM) techniques for full bridge inverter application. It's utilized for storing pre-programmed duty cycles with its memory by using mikroBasic PRO for PIC. This eliminated the need for large analog components which often have a tendency to become unstable.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This report focuses on DC to AC power inverters, which aim to efficiently transform a DC power source to a high voltage AC source, similar to power that would be available at an electrical wall outlet. Inverters are used for many applications, as in situations where low voltage DC sources such as batteries, solar panels or fuel cells must be converted so that devices can run off of AC power. One example of such a situation would be converting electrical power from a car battery to run a laptop, TV or cell phone.

The method, in which the low voltage DC power is inverted, is completed in two steps. The first being the conversion of the low voltage DC power to a high voltage DC source, and the second step being the conversion of the high DC source to an AC waveform using pulse width modulation. Another method to complete the desired outcome would be to first convert the low voltage DC power to AC, and then use a transformer to boost the voltage to desire voltage such as 230V. This project focused on the second method described and specifically the conversion of the low voltage DC power to AC, and then uses a transformer to boost the AC voltage.

Of the different DC-AC inverters on the market today there are essentially two different forms of AC output generated: modified sine wave, and pure sine wave [1]. A modified sine wave can be seen as more of a square wave than a sine wave, it passes the high DC voltage for specified amounts of time so that the average power