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DECLARATION SHEET

I hereby declare that my Final Year Project Thesis is the result of my research work under supervision of En. Muhd Hatta Bin Hussain and co-supervisor En. Nor Haidar Bin Hashim. All literature sources used for the writing of this thesis have been adequately referenced.

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MENCIPTA DAN MEMBANGUNKAN PENUKAR TERBANG BALIK 100 W AC-DC

ABSTRAK

Projek ini adalah berasaskan mereka, membina dan membangunkan penukar terbang balik 100 W AC-DC. Litar ini direka menggunakan perisian PSIM. Ia direka untuk pelbagai nilai masukan AC dan litar ini akan diuji dalam pelbagai bentuk keadaan dan situasi. Penukar bekalan kuasa ini mempunyai julat voltan masukan 110 - 220 V AC dan menyediakan nominal 12 V, 8 A muatan penuh keluaran DC. Reka bentuk ini menggunakan topologi penukar terbang balik dengan menggunakan pengawal PWM UC3844AN sebagai alat kawalan dan suis utama. Penukaran frekuensi berbeza-beza menurut keadaan elektrik dan beban. Projek ini mempunyai kadaran kuasa 100 W dan julat frekuensi 50 - 60 Hz. Objektif utama projek ini adalah untuk membandingkan nilai voltan dan arus melalui pengiraan dan simulasi menggunakan perisian Power Simulator (PSIM) seterusnya mendapatkan keluaran yang malar, julat frekuensi dan kecekapan yang tinggi daripada penukar terbang balik sama ada menggunakan spesifikasi Piawaian Malaysia (MY) atau Piawaian Amerika (US).

DESIGN AND DEVELOPMENT 100 W AC-DC FLYBACK CONVERTER

ABSTRACT

This project basically is to design, built and develop 100 W AC - DC flyback converter. This circuit is design by using PSIM software. It is design for universal AC line input and the circuits will be test under various stated conditions. This Switch Mode Power Supply (SMPS) has the input voltage range 110 - 220 V AC and provides a nominal 12 V, 8 A full load DC output. The design uses a flyback converter topology, with a PWM controller UC3844AN as the main switch and control device. Switching frequency varies according to line and load condition. The project has a rated power of 100 W and a frequency range about 50 - 60 Hz. The main objective of this project is to compare value of voltage and currents from calculation and simulation by using Power Simulator (PSIM) software and obtain constant output, high efficiency and frequency range from the hardware either using specification of Malaysia Standard (MY) or America Standard (US).

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LIST OF SYMBOLS, ABBREVIATIONS AND NOMENCLATURE

V	Volt
W	Watt
R	Resistance
I	Current
Ω	Ohm
Π	Phi
AC	Alternate Current
DC	Direct Current
PSIM	Power Simulator
PWM	Pulse Width Modulator
SMPS	Switch Mode Power Supply
EMI	Electromagnetic Interference
Hz	Hertz
D	Duty cycle
P	Power
µ	Micro
PF	Power factor
BD	Bridge diode rectifier
T	Time
MY	Malaysia Standard
IEC	Europe Standard
CH1	Channel 1
CH2	Channel 2