

**DESIGN AND SIMULATION OF SERIES LOADED RESONANT
CONVERTER**

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ACKNOWLEDGEMENT

In the name of Allah, the Beneficent, the Merciful. It is wish the deepest sense of gratitude to Allah who has given me the strength and ability to complete this project and the thesis as it is today. All perfect praises belong to Allah swt, Lord of the universe. May His blessings upon the Prophet Muhammad saw, and members of his family and companions.

Upon completing this project, I had gain a gratefully support from my supervisor, Dr.Mohammad Nawawi Haji Seroji. Million thanks for him because of his willingness to spend his time, his expertise, his technical assistance that helping me completes this study and lending his ears to hear my problems and shed my tears. It is my pleasure to work with him. Hopefully, there will be another opportunity to cooperate in the future.

Last but not least, I thank my family and friends for the constant and active support throughout my studies. And for those who made an important contributions to the completion of this project and thesis. I am also wanted to thank to Dr Ahmad Maliki and Mr. Ahmad Ehsan who spend their time for me and teach me a good lesson upon completing this project. Thank you sir.

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MEI 2010*

ABSTRACT

The title of this project is Design and Simulation of Series Loaded Resonant Converter. Basically, this thesis includes the design techniques and simulation of the series loaded resonant converter operating above resonance. The half-bridge series loaded resonant topology is considered in this paper. This converter had been designed based on 100 kHz switching frequency with variation of input voltage of $50V \pm 20\%$. From the voltage conversion ratio, $\frac{V_o}{V_{in}}$ curve, the desired natural frequency, ω_o can be determined by approximate the value of ω_n which is 1.1. The value of resonant frequency f_o can be determined. The result shows that the tank circuit (L and C) is maintained in the continuous conduction mode which gives sinusoidal waveform. Detailed circuit simulation is carried out using PSIM simulation package to verify the circuit operation. Thus, the simulation results and theoretical value can be compared.

TABLE OF CONTENTS

CHAPTERS	DESCRIPTION	PAGE
	Approval	ii
	Declaration	iii
	Dedication	iv
	Acknowledgement	v
	Abstract	vi
	Table of Content	vii
	List of Abbreviations	ix
	List Of Figures	x
	List of Tables	
1	INTRODUCTION	
	1.0 Introduction	1
	1.1 Background study of resonant converter	3
	1.2 DC to DC converter (Chopper)	6
	1.3 Project objective	6
	1.4 Scope of Work	7
	1.5 Thesis organization	8

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Power electronic is the technology that links the two major traditionally divisions of electrical engineering, namely electrical power and electronic. It has shown rapid development in recent times, primarily because of the development of semiconductor power devices that can efficiently switch large currents at high voltages and so can be used for the conversion and control of electrical energy at high power levels. The parallel development of functional integrated circuits for the controlled switching operation of power electronic converters for specific applications also contributed to this development.

Power electronic techniques are progressively replacing traditional methods of power conversion and control, causing what may described as the technological revolution, in power areas such as regulated power supply system, adjustable speed DC and AC electric motor drive and high voltage DC links between power network.