

DC-TO-DC RESONANT CONVERTER USING POWER MOSFET

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ABSTRACT

This paper describes the design of a dc-to-dc (chopper) converter for resonant condition. This resonant converter is designed to be used in high frequency application. The parallel arrangement of resistor, inductor and capacitor is used in the design to develop the resonant frequency. Simulation results show that the proposed design gives better efficient operation at higher switching rates.

TABLE OF CONTENTS

CHAPTER DESCRIPTION	PAGE
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
FIGURES	vii
LIST OF TABLES	ix
LIST OF ABBREVIATIONS	x
1 CHAPTER 1: INTRODUCTION	
1.1 Introduction.	1
1.2 Scope of Work	1
1.3 Scope of Thesis	2
2 CHAPTER 2: RESONANT POWER SUPPLIES	
2.1 Introduction	3
2.2 Types of Converter	4
3 CHAPTER 3: TANK CIRCUIT	
3.1 Introduction	9
3.2 Tank Circuit as Generator	9
4 CHAPTER 4: SWITCHING DEVICE	
4.1 Introduction	13
4.2 The Power MOSFET	13
4.3 Advantages of Power MOSFET	16

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Resonant converter topologies are being widely used in power processing systems because of their soft-switching characteristics at high frequency [1]. The advantages of high-frequency operation include smaller size and lighter weight for the passive components. The main problem of operating at high frequency is the switching loss associated with the switches that are primary power devices.

The application of metal oxide semiconductor field effect transistor (MOSFET) as controllable switches in high-frequency soft-switching systems is gaining considerable attention because of their superior power-handling capabilities [2]. A critical understanding of the switching performance of MOSFETs in resonant converter applications is needed to obtain efficient power conversion at high switching frequencies.

1.2 Scope of Work

The objective of this project is to design a resonant converter using Power MOSFET as a switching device. The resonant converter is to be used to produce the resonant frequency in a power supply unit. Parallel arrangement of Resistor (R), Inductor (L) and Capacitor (C) was used in this resonant converter design. The design circuit was simulated using Circuit Maker professional version to obtain the output waveform of the circuit. The proposed circuit was also fabricated and tested to obtain the necessary results.