CHAPTER 1

INTRODUCTION

1.1 Overview

This chapter consists of four elements which are background of study, problem statement, objectives, and scope of project. For background of study, it is about the general introduction of this project. Problem statement of this project was included in this chapter. It stated about how this project will be doing. Besides that, this chapter is also as the main support for the objectives in order to ensure the relevancy of the project. There are two objectives that must be achieved at the end of this project. Lastly, for the scope of project, this sub topic is explaining on what this project is focused on.

1.2 Background of Study

Converter is a device for altering the nature of an electric current or signal. It consists of AC-AC converter and DC-DC converter. DC-DC converter is an electronic circuit which converts a source of direct current from one voltage level to another [1]. DC-DC converter can be divided into two main types which are hard-switching pulse width modulated (PWM) converters and resonant and soft-switching converters [2]. The PWM converters have been very popular for the last three decades [3]. They are widely used at all power levels. Advantages of PWM converters include low component count, high efficiency, constant frequency operation, relatively simple control and commercial availability of integrated circuit controller and ability to achieve high conversion ratios for both step down and step up application [3]. The disadvantage of PWM DC-DC converter is that PWM rectangular voltage and current waveform cause turn-on and turn-off losses in semi-conductor devices which limit practical operating frequencies to a megahertz range. Parasitic is non-ideal parameter used such as resistance, capacitance and inductance [2]. Non-idealities or parasitic of
practical devices and component may, however greatly affect some performance parameters of DC-DC converter [2].

1.3 Problem Statement

No study ranges for ESR in order to determine the output voltage ripple and efficiency in particular converters.

1.4 Objectives

The aim of this project is to study the effect of the ESR (Equivalent Series Resistor) on the performance parameter of DC-DC converter.

The main objectives of this project are:

1. To analyse the effect of parasitic on output voltage ripple.
2. To analyse the effect of parasitic on efficiency.

1.5 Scope of Study

The works undertaken in this project are limited to the DC-DC buck converter, DC-DC boost converter and DC-DC flyback converter. All of these three converters must run in CCM. The value of the voltage used for buck is 11 V, for boost is 12 V and for flyback is 36 V.