FUZZY LOGIC CONTROLLER ON CONTROL BOOST DC-DC CONVERTER

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ABSTRACT

This paper describes the design of a Fuzzy Logic Controller using voltage output as feedback for significantly improving the dynamic performance of Boost Dc-Dc Converter by using MATLAB/Simulink software. The objective of this proposed methodology is to develop Fuzzy Logic Controller on control Boost Dc-Dc Converter using MATLAB/Simulink software. Fuzzy Logic Controller has been implemented to the system by developing Fuzzy Logic Controller algorithm. The design and calculation of the components especially for the inductor has been done to ensure the converter operates in Continuous Conduction Mode (CCM). The evaluation of the output has been carried out and compared by software simulation using MATLAB/Simulink software between the open loop and closed loop circuit. The simulation results are shown that voltage output is able to be control in steady state condition for Boost Dc-Dc Converter by using this methodology.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1   Introduction

Nowadays, the control systems for many power electronic appliances have been increasing widely. Crucial with these demands, many researchers or designers have been struggling to find the most economic and reliable controller to meet these demands. The idea to have control system in Dc-Dc Converter is to ensure desire voltage output can be produce efficiently to meet the demand need. Basically, feedback controller compares the output of the power processor unit with a reference value, and the error between the two is minimized by the controller. Figure 1.1 shows a power electronic system block diagram.
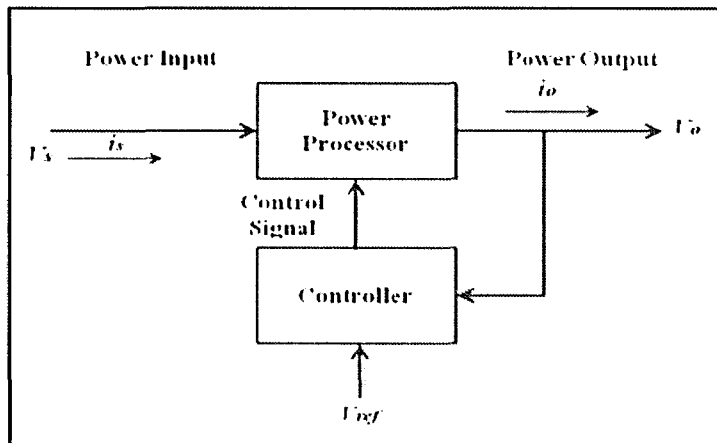

Figure 1.1: Block Diagram of Power Electronic System

Conventionally, there are many popular controllers and widely used in most power electronic appliances such as PI, PD and PID controller however those controllers requires such a complex mathematical model in order to control the process or may be expensive in terms of computer processing power and memory, and a system based on rules based likes Fuzzy Logic Controller may be more effective. Dc-Dc Converters have been dominating controlled by analogue integrated circuit technology and linear system control design techniques [1].