

**COMPARATIVE STUDY OF FUZZY LOGIC CONTROLLER
AND PROPORTIONAL INTEGRAL DERIVATIVE
CONTROLLER ON DC-DC BUCK CONVERTER**

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ABSTRACT

The dc-dc converters are used to supply power to different system with highly efficient and have nonlinear behavior. The variations on the main parameter gave affected on the stability, thus desired amount of voltage couldn't be supply. As a solution, controller is added to the system in order to achieve a simple control circuit in regulating the output of the dc-dc converters. There are two strategies are used in this paper. First a knowledge based on fuzzy is studied and another control strategy is linear Proportional Integral Derivatives controller is applied. The main objective of this document is to compare the performance between Fuzzy Logic controller (FLC) and Proportional Integral Derivative controller (PIDC) in improving the performance of DC/DC Buck Converters. The evaluation of the output has been carried out and compared by software simulation using MATLAB Simulink. Fuzzy logic controller has been implemented to the system by developing fuzzy logic control algorithm. The signals will be processed based on the fuzzy logic rules-based and produce the output.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Task of power electronics is to process and control the flow of electrical energy by supplying voltages and currents that suited for optimally load's user. Figure 1.1 shows a power electronic system block diagram. The output of power processor is as desired by load. Generally, the feedback controller compares the output of the power processor unit with reference value, and the error between this two is minimized by the controller [1].

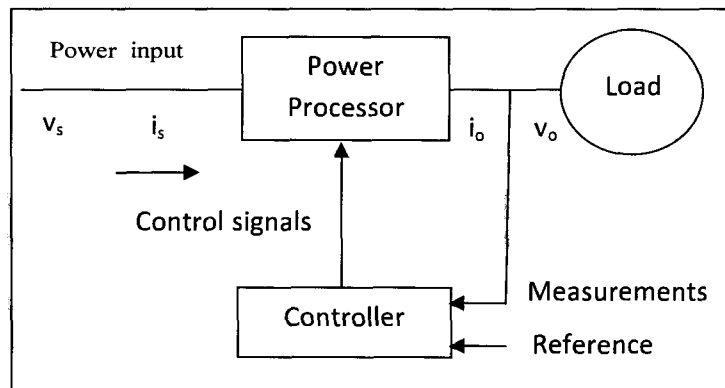


Figure 1.1: Block diagram of Power Electronic System

Power electronics are based on the switching of the power semiconductor devices. With the development of power semiconductor technology, the power handling capabilities and the switching speed of the power devices have improved tremendously [2]. The development on controller consists of linear