POWER ELECTRONIC BUCK CHOPPER

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ABSTRACT

This thesis presents the implementation of the dc buck converter for trainer applications. The design is based on Peripheral Interface Controller field programmable that acts as a controller. The output voltage is controlled using well-known Pulse Width Modulation (PWM) technique. With continuous input and output current, wide output voltage range and small output filter, Buck topology has gathered more and more attention in recent years. Soft switching is especially important to a buck converter because the power handling capability requirements of semiconductor devices are higher than those of other topologies. Satisfactory agreement between simulated and laboratory results were observed.

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CHAPTER 1

BACKGROUND OF THESIS

1.1 Introduction

Power electronics is the technology of converting electric power from one form to other using electronic power devices. Several type of solid state power semiconductor devices have been develop in recent years, making it possible to build efficient power converters with excellent facility for control of output parameters, such as voltage, current or frequency .In static power converter, the power semiconductor devices function as switches, which operate statically, that is , without moving contact. The time durations, as well as the turn ON and turn OFF operations of these switches, are controlled in such a way that an electrical power source at the input terminals of the converter appears in a different form at its output terminals. In most types of converters, the individual switches in the converter are operated in a particular sequence in one time period, and this sequence is repeated at the switching frequency of the converter [4]

Power electronic is the technology that links the two major traditional divisions of electrical engineering, namely, electric 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.

Power electronics converters may be classified into four categories on the basis of the type of the desired output characteristics:

i. AC to DC converters (controlled rectifiers)
ii. AC to AC converters (AC voltage controllers)
iii. DC to DC converters (DC choppers)
iv. DC to AC converters (Inverters)