

**STUDY OF BOOST CONVERTER USING MOSFET SINGLE
PHASE MATRIX CONVERTER (SPMC)**

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ABSTRACT

This paper presents a design and simulation of DC/DC boost converter operation of Single-Phase Matrix Converter (SPMC) using MOSFET as main power switching devices. The well-known Pulse Width Modulation (PWM) switching technique is used to control on and off of the SPMC circuit. Simulation model is developed using software Mentor Graphic to study the behavior of proposed technique. Selected simulation results are presented to verify the operation.

CHAPTER 1

INTRODUCTION

1.0 BACKGROUND OF STUDY

Before the 1900s, a very first implementation was to use a separate DC-DC converter for each output. This is a straightforward and timesaving method with many available commercial chips. On the other hand, it causes too many bulky power devices as inductors, capacitors, and control ICs. Hence, the cost for implementation of one and mass-production is apparently expensive. To overcome the problems, from the 1900s until now, many designers have developed their researches on Multiple-Output ICs, where there is only single IC to control several outputs. This approach can reduce remarkably the Printed Circuit Board (PCB) areas, and from that, reduce the implementation cost. However, DC-DC converters of this type still require one energy-storage component, usually an inductor, for each output [1]. Dc-dc power converters are employed in a variety of applications, including power supplies for personal computers, office equipment, spacecraft power systems, laptop computers, and telecommunications equipment, as well as dc motor drives. A DC to DC Converter is a circuit which converts a source of direct current (DC) from one voltage level to another. In many applications, there is a need to convert one DC voltage to another DC voltage, either increasing or decreasing it. Such electronic devices often contain several sub-circuits, each with its own voltage level requirement different from that supplied by the battery or an external supply (sometimes higher or lower than the supply voltage, and possibly even negative voltage). A boost converter is simply is a particular type of power converter with a