

**HIGHER TECHNICAL INSTITUTE**

**ELECTRICAL ENGINEERING DEPARTMENT**

**DIPLOMA PROJECT**

**EXTREMELY HIGH VOLTAGE GENERATION FROM  
LOW VOLTAGE (BATTERIES)**

by

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**JUNE 1995**

**HIGHER TECHNICAL INSTITUTE  
ELECTRICAL ENGINEERING DEPARTMENT  
ACADEMIC YEAR 1994-95**

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FROM LOW VOLTAGE (BATTERIES)**

**E/972**

Project report submitted by  
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in part satisfaction of the  
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June 1995



**DEDICATED  
TO MY FAMILY**

### ACKNOWLEDGEMENTS

I would like to express my thanks to my project supervisor, Mr Christos Marouchos for the information given to me about SG3524 and his help throughout the project period.

My thanks and appreciation are extended to Mr. Michael Souropetsis and Stelios Theodorou (Sprel Company) for letting me use the laboratory of their company and the guidance given to me.

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# CHAPTER 1

## 1.1 INTRODUCTION

This project has as main parts a push-pull transformer-coupled circuit and a flyback converter circuit. The idea is to use as input a low voltage battery. By the help of a sensitive electronic switch (for the control part) one becomes aware of the severe problems, disturbances through an inductor to charge a capacitor. This sensitive electronic switch was chosen to be the SG3524. It is an industrial standard.

The SG3524 regulating pulse width modulator contains all of the control circuitry necessary to implement switching regulators of either polarity, transformer coupled DC to DC converters, transformerless polarity converters and voltage doublers as well as other power control application. This device includes a 5V voltage regulator capable of supplying up to 50mA to external circuitry, a control amplifier, an oscillator, a pulse width modulator a phase splitting flip-flop, dual alternating output switch transistors and current limiting and shutdown circuitry..

The features of this ic are:

- I. Complete PWM power control circuitry.
- II. Frequency adjust to greater than 100 KHz.
- III. 2% frequency stability with temperature.
- IV. Total quiescent current less than 10mA.
- V. Dual alternating output switches for both push-pull or single ended applications.
- VI. A current limit amplifier provides external component protection.
- VII. 5V, 50mA linear regulator output available to user.

The Capacitor (4.7 $\mu$ F, 250V) Figure 1.1 acts as a high voltage source giving an input to an autotransformer. Hence, will get an extremely high voltage from autotransformers output.