

XILINX SOFTWARE CONTROLLED SINGLE PHASE PWM
INVERTER

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Engineering (Honours) in Electrical

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ABSTRACT

This report involves constructing a full bridge inverter circuit that is suitable for Uninterruptible Power Supplies (UPS), using the Insulated Gate Bipolar Transistors (IGBT) as the main switching devices. The Xilinx Complex Programmable Logic Devices (CPLD) is used to generate the control signal for required Pulse Width Modulation (PWM) switching pattern. The PWM switching techniques enable the output voltage to be controlled by changing the Modulation Index (M_a). Two types of PWM switching techniques: Sinusoidal and Straight-line PWM are considered.

Simulation results obtained made it possible to compare the advantages and disadvantages of PWM controlling techniques, the power loss and voltage stress exist in the switching devices, and the one of PWM pattern will be chosen to be applied in the Xilinx CPLD controller. The PWM pattern was chosen is Straight Line PWM.

TABLE OF CONTENTS

Acknowledgement	iv
Abstract	v
1. Introduction	1
1.1 Xilinx Foundation Series 2.1	3
1.1.1 Xilinx FPGA	3
1.1.2 CPLD	4
1.2.3 PWM switching scheme	5
(a) Bipolar switching	6
(b) Unipolar switching	6
1.2.1 Straight line PWM	9
1.2.2 Sinusoidal pulse width modulation	11
1.2 The PWM Strategies	9
2. System Overview	13
2.1 System Design Overview	13
2.1.1 Functional block system	15
3. Circuit Configuration	17
3.1 Inverter Circuit	17
3.1.1 IGBT	20
3.1.2 Snubbers circuit	21
3.2 Phase detector circuit	24
3.2.1 Introduction	24
3.2.2 Operation	24
3.3 IGBT gate driver circuit	27
3.3.1 Testing of driver circuit	28
4. Simulation Circuit	30
4.1 PSPICE simulation	30

4.1.1	Sinusoidal Pulse Width Modulation	30
4.1.2	Straight Line PWM	33
4.2	Xilinx simulation	36
4.2.1	Sinusoidal Pulse Width Modulation	36
4.2.2	Hardware Description Language	39
(a)	Flowchart for multiplier	40
(b)	Flow chart for detector	42
4.2.3	Straight Line PWM	43
5.	Result	45
5.1	Simulation result for SPWM	45
5.1.1	Using Xilinx software	45
5.1.2	Using Pspice software	48
5.1.2.1	SPWM at input voltage 30 VDC	52
5.1.2.2	SPWM at input voltage 50 VDC	56
5.1.2.3	SPWM at input voltage 100VDC	56
5.2	Simulation result for Straight line PWM	60
5.2.1	Using Xilinx software	60
5.2.2	Using Pspice software for straight line PWM	62
5.2.2.1	Straight line PWM at input voltage 30 VDC	66
5.2.2.2	Straight line PWM at input voltage 50 VDC	65
5.2.2.3	Straight line PWM at input voltage 100VDC	65
5.3	Experimental result	74
5.3.1	CPLD board output for straight line PWM.	74
5.3.2	Driver output	75