Review Paper On Multi-level Inverter For Residential Purpose

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***Abstract*: In this paper we are trying to demonstrate how to reduce the harmonic by using a H-bridge topology. Topology are same however technology are change. By using less number of switch we can achieve desire level of output. In this paper we will be discussing about the single phase multi-level inverter for residential purpose. Harmonic will be reduce by selecting appropriate switches. The working of this five level inverter will be observe on MATLAB.**

Keyword*: *PWM, 5-Multi level inverter, Harmonic Reduction, MATLAB.

I. INTRODUCTION

A power inverter or inverter is an electronic device or circuitry that change direct current (DC) to alternating current (AC).The input voltage and output voltage, frequency , and overall power handling is depend on the design of the specified circuitry. The power is provided by the DC source .The power inverter can be a entirely electronic circuitry. From Last few decades the requirement of low power electronic device has been increased. People are selecting device which have low power consumption and have good efficiency. A multilevel converter not only achieves high power ratings but also enable to use as renewable energy source. Renewable energy source such as photovoltaic and fuel cells can be easily interfaced to a multilevel converter system for a high power application. When the level of inverter is increased the output voltage waveform will be ripple free and harmonic will be reduced. The result in high voltage output with the harmonic there are many techniques by which we can analysis the harmonics and get a pure sine wave.

In this project we are studying five-level inverter using pulse width modulation (PWM) techniques. In conventional type of inverter 8-switches were required for 5-level we are using H-bridge topology. In which the complex-city of circuit get reduce and the switches are arrange in bridge form like 4 switch are connected in a bridge and both bridge are connected in series with each other as show in fig.(1).

The output of this inverter will be observe on digital oscilloscope. In this project we will use arduino as a controller for a generating the pulse

II. MULTI LEVEL INVERTER

A multilevel inverter is a power electronic device which is capable of providing desired alternating voltage level at the output using multiple lower level DC voltages as an input. Multilevel inverter technology has emerged recently as a very important alternative in the area of high-power medium-voltage energy control. The different multilevel inverter topologies are: Cascaded H-bridges converter, Diode clamped inverter, and Flying capacitor multilevel inverter. Multilevel inverters nowadays are

used for medium voltage and high power applications. The different field of applications include its use as UPS, High voltage DC transmission, Variable Frequency Drives, in pumps, conveyors etc.

III. ARDUINO AS A CONTROLLER

Arduino is an open-source electronics plateform based on easy to use hard and software. its simple and accessible user experience , Arduino had been used in thousand of different project and application. To control single phase sine wave inverter we are proposing Arduino as a controller. This inverter will convert 12 Volt DC voltage to 220 Volt. In this project we are using H-bridge topology for the conversion of DC to AC voltage. Step up transformer is used to step up output of H-bridge to 220 Volt AC. After step up transformer the LC Filter is use to get a pure sine wave from pulsating output wave As shown is fig.2

Arduino is use to generate control signal for MOSFET driver using SPWM (Sinusoidal Pulse Width Modulation) techniques. MOSFET driver is used to drive four MOSFET connected in H-bridge configuration.

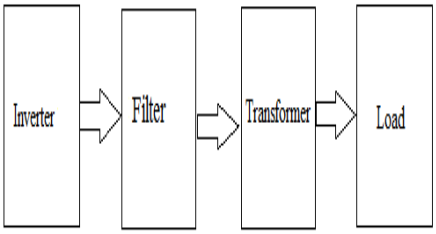

Fig.1:Block diagram of the proposed inverter

IV.H-bridge using MOSFET

H-bridge is use to convert the operation in positive direction and negative direction. According to PWM getting signals to MOSFET generate both positive and negative half cycle of AC voltage.

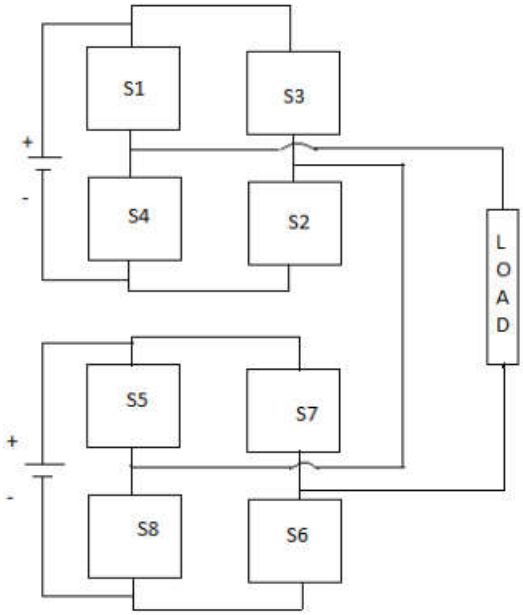

Fig. 2: five level inverter circui

MATLAB SIMULATION

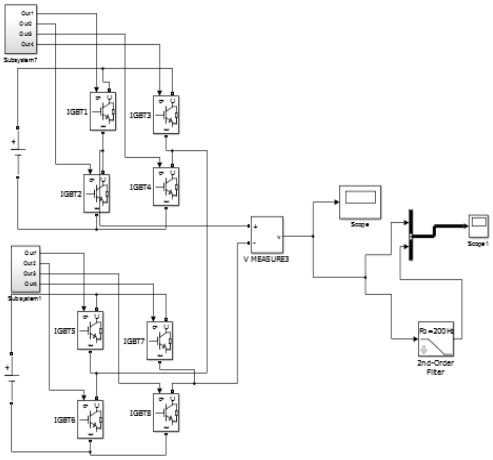

Fig.3: MATLAB simulation of five level inverter

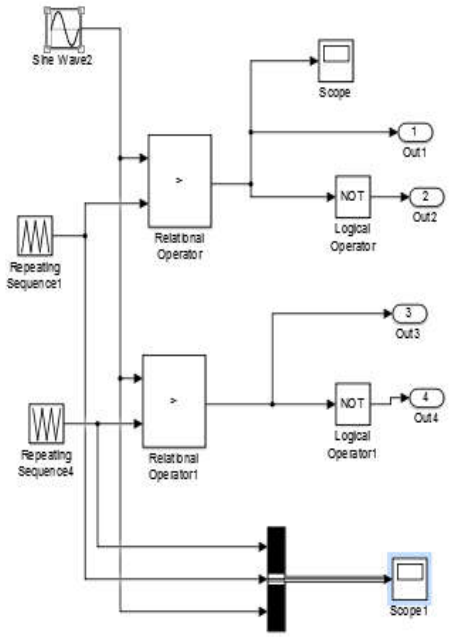

Fig.4: subsystem of gate trigger

Switching table

Pulse no.	0	V	2V	V	0	-V	-2V	-V	0
angle	36	72	108	144	216	252	288	324	360
S1,s2,s3			SWITCH ON						
S3							SWITCH ON		
S7,S4,S8									
S5			SWITCH ON						

Waveform

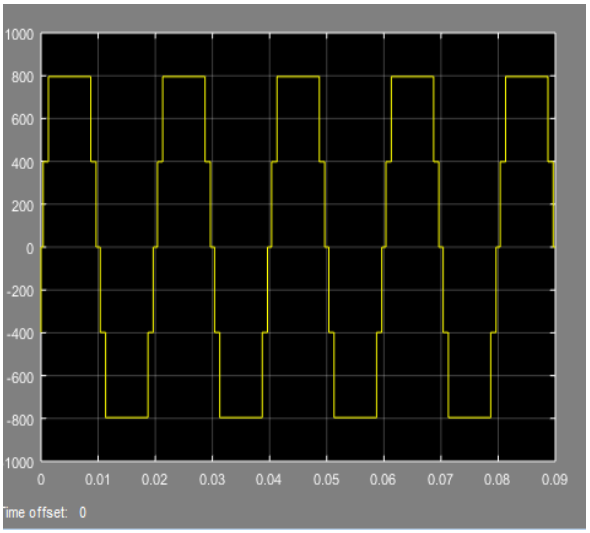

Fig.5: waveform of steps

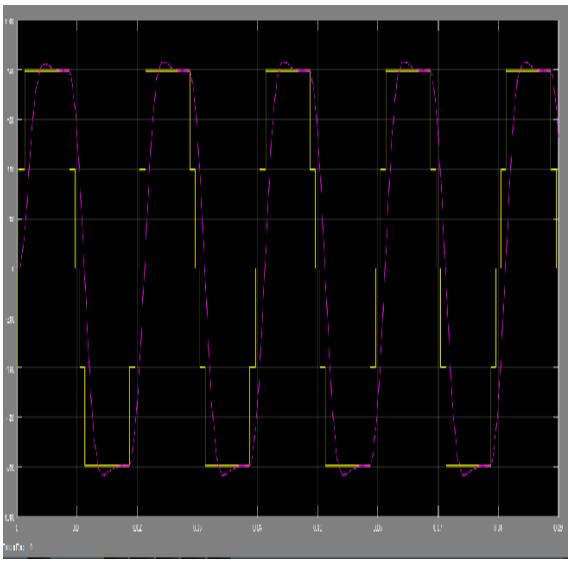

Fig.5: final output waveform of inverter

CONCLUSION

In this paper, the cascade H-bridge multilevel inverter from its name suggest that output will be of multilevel in the form of staircase. The Cascade H-Bridge multilevel inverter is the series connection of H-bridges which is combination of eight power switches. The output level depends on the number of H-bridge use in inverter circuit and also the number of available DC sources. Cascade H-bridge require separate DC sources. As the number of switches are more in cascade multilevel inverter the voltage stress on individual switch will be less. Here we are used SPWM techniques. In this techniques we have used comparison of sine and triangular wave to generated switching pulses by matlab simulation.

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