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Implementation of Switching Method

G.Vasumathi, Deepa.M

Assistant Professor, Department of Mechatronics, Bharath University, Chennai, India

ABSTRACT: In converters, the harmonics are penetrated into the power system increase, which affects utilities and end users. One of the methods to reduce harmonics is the usage of multilevel inverter. This paper presents new pulse width modulation technique for Multilevel Inverter. Dual carrier and dual reference methods are used for single phase five level modified H Bridge inverter and three reference modulation techniques is used for a single phase seven level modified H Bridge inverter. This paper proposes a novel soft-switching Single phase ac– dc converter to give high input power factor and low current distortion on the rectifier side and provide clean and stable ac voltage on the inverter side. The proposed converter uses a zero voltage switching (ZVS) strategy to get ZVS function. Besides operating at constant frequency, all semiconductor devices operate at soft-switching without additional voltage stress. A significant reduction in the conduction losses is achieved, since the circulating current for the soft switching flows only through the auxiliary circuit and a minimum number of switching devices is involved in the circulating current path, and the rectifier in the Proposed converter uses a single converter instead of the conventional configuration composed of a four-diode front-end rectifier followed by a boost converter. An average-current-mode control is employed in the rectifier side of proposed converter to detect the transition time and synthesize a suitable low harmonics sinusoidal waveform for the input current.

I INTRODUCTION

BOOST CONVERTER

The boost converter performs the functions of power factor correction and boost ac–dc conversion. Therefore, the ac–dc–ac system have been widely used in industrial application such as uninterruptible power supplies(UPS), ac power source, static frequency changers and variable speed drives. [3][4]An average-current-mode control is employed in the rectifier side of proposed converter to synthesize a suitable low harmonics sinusoidal waveform for the input current. The sinusoidal pulse-width modulation (SPWM) control strategy is employed in the inverter of proposed converter to achieve good dynamic regulation. System analysis for predicting and evaluating the ac–dc converter performance are conducted.

II PROPOSED METHOD

A. AC soft switching

Soft switching is a technique where no mechanical switches are used. Minimization of size and weight of overall system, increasing switching frequency in them is required. [5][6]However, increasing switching frequency will result in more switching losses. In order to overcome this problem, they must use individual soft-switching techniques. This solution will result in high complexity of overall circuit, high weight, high cost and low efficiency. In order to overcome previous problems, a number of zero voltage switching (ZVS) techniques which the auxiliary commutation cells are shared between the rectifier and inverter have been proposed

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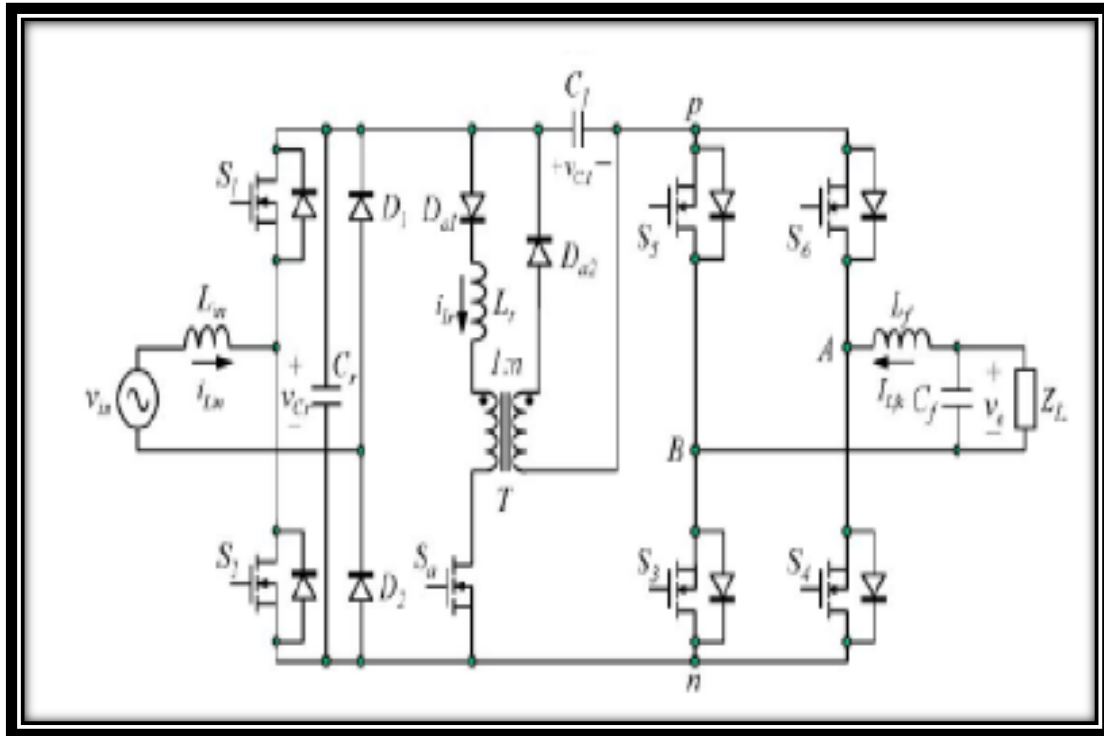


Figure 1. Proposed diagram

. The ac– dc–ac converter uses individual soft-switching techniques to reduce their switching losses. The advantages of conventional ac–dc– ac converter is that a novel high input power factor soft-switching single-stage ac–dc–ac converter can be employed by using a ZVS–PWM strategy.[1][2]

III.SIMULATION RESULT

The output of the proposed converter has been simulated and a simulation result has been achieved.

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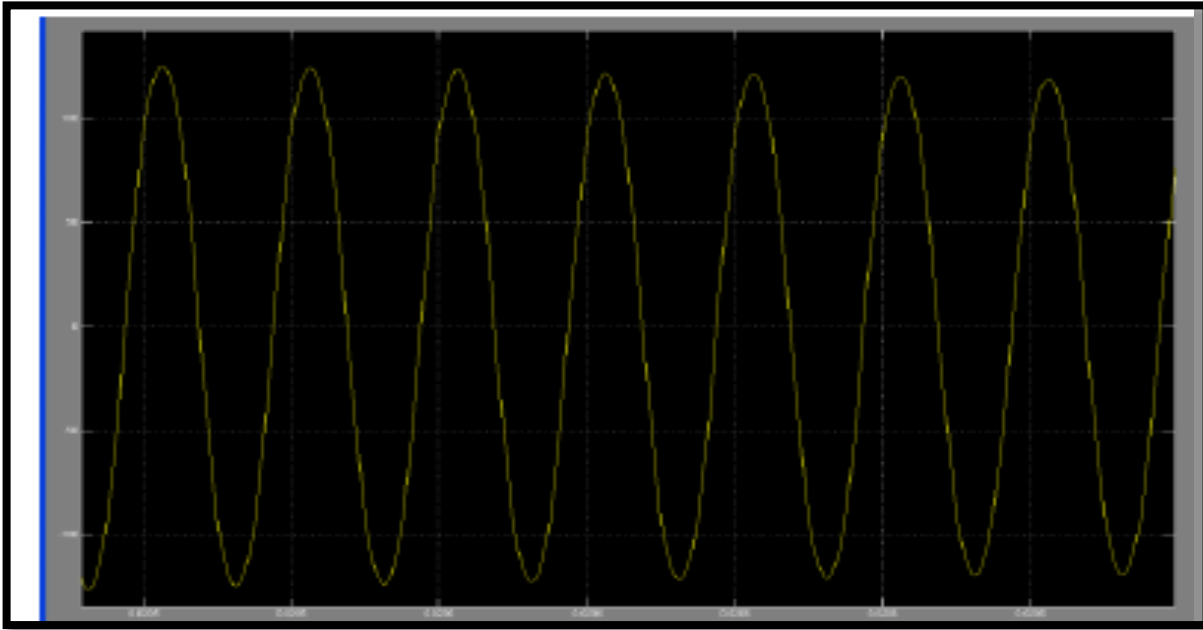


Figure 2. Simulation Results

IV. CONCLUSION

The proposed converter uses a zero voltage switching (ZVS) strategy to get ZVS function. Besides operating at constant frequency, all semiconductor devices operate at soft-switching without additional voltage stress. A significant reduction in the conduction losses is achieved, since the circulating current for the soft switching flows only through the auxiliary circuit and a minimum number of switching devices is involved in the circulating current path, and the rectifier in the Proposed converter uses a single converter instead of the conventional configuration composed of a four-diode front-end rectifier followed by a boost converter.

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