Design of step-up converter using eSim and Verilog

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***Abstract*—This paper presents a design of mixed signal on step-up converter to boost input voltage. The step-up converter presented here offers a good efficiency performance. The proposed converter is designed in eSim tool and Verilog.**

Keywords— step-up converter.

I.INTRODUCTION

In linear mode power supply there is always loss of energy in the form of heat and it is quite inefficient for high power application. And hence a switched-mode power supply power supply also known as SMPS has been introduced for energy efficient applications such as portable devices, SMPS are infact also used extensively in high power applications.

A step-up converter is also known as boost converter, as the name suggests it steps up the input voltage to higher voltage, since the power is always conserved therefore the current in the output is lower than the input current and thus power is conserved. A typical step-up converter consists of a switch (transistor) and a diode as a semiconductor device, and storing element: inductor and a capacitor, the former is to store electrical energy in the form of magnetic energy and the later is to smooth the output voltage i.e., to filter out the ripple.

II.REFERENCE CIRCUIT DETAILS

The working principle of the step-up converter can be explained as follows-

1) When the transistor is ON state, current starts flowing through the inductor stores electric energy by generating magnetic field around it.

2) When the transistor is turned OFF, inductor will pump out its stored energy through the diode and current will start flowing through it. At higher switching speed inductor will not be able to discharge fully in between charging stages which as a result, a voltage higher than the input voltage will be developed at its output. Using Verilog the PWM signal can be generated to drive the gate of the transistor.

III.IMPLEMENTED CIRCUIT DIAGRAM

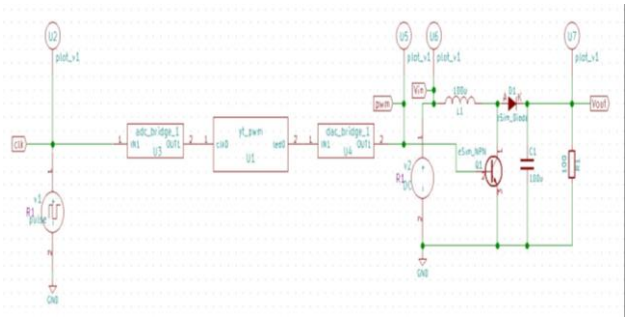

Fig1: Implemented circuit Diagram of Boost Converter.

IV.IMPLEMENTED WAVEFORMS

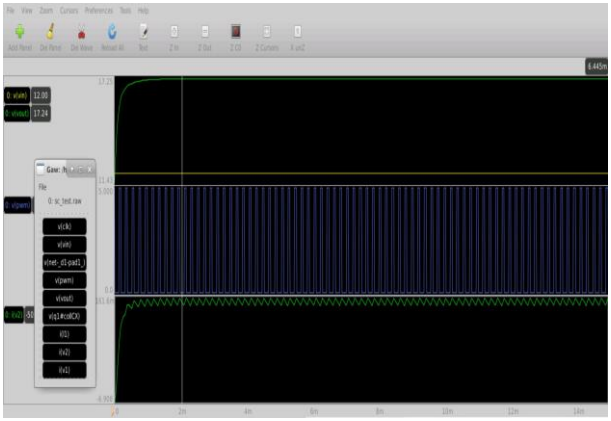

Fig2: Implemented waveforms

V.REFERENCES

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