Portable Mobile Charger for outdoor trips

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Abstract

In the paper with the interest in the generation of power and management of the same we present a Portable Cell Phone Charger that can be used any where .Also this device is convenient to be handled when anyone is on outdoor trips .This device is both practical and convenient. It is obvious that a device that could charge cell phone batteries just by the use of human harvesting energy is a very appealing and valuable product . My main aim here is to replace the diodes which have a cut off voltage of 0.7 V with transistors which is cheaper more mechanical sensitivity and lower threshold voltage. Here I will just present the simulations of a manual simple charger replace with MOS in my final simulation .

1 Circuit Details

There are 2 parts of the circuit 1) The rectification and 2) The voltage regulation. The circuit consists of a AC input source of already stepped down voltage as the step down transformer in Spice can't be modelled. The Transformer turns ratio should be calculated via the given below formula equation Np/Ns equals to Ep/Es where the Ns is the number if turns in the primary coil and the Ns is the number of turns in the secondary coil . The Ep is the voltage across the primary node and the Es is the voltage across the secondary node and the capacitance values to reduce the ripple must be calculated by the C=1/2xfxVripple , where C is the capacitor filter and the V ripple is the ripple we want to attain or desire . The output then rectified via a full wave bridge rectifier as the sub circuit where I have used Mosfet as switches instead of diodes .In this final report circuit I have not been able to implement a LM7805 as the spice net list was not included in the ESIM software, instead I used a DC 5 V to just simulate the circuit. Actually the output of the rectifier will be passed through a LM7805 voltage regulator whose output is always 5V. LM7805 is a voltage regulator which will regulate any input voltage across it input to 5 voltage but up to a certain limit so we need to absolutely sure that there is not much voltage drop across the input components of the LM7805. A Zener of 5V voltage rating will be used to protect the LM7805 and the output from getting distorted. Isolation diode is used in between rectifier and voltage regulator , here 5 V DC supply.

2 Implemented Circuit

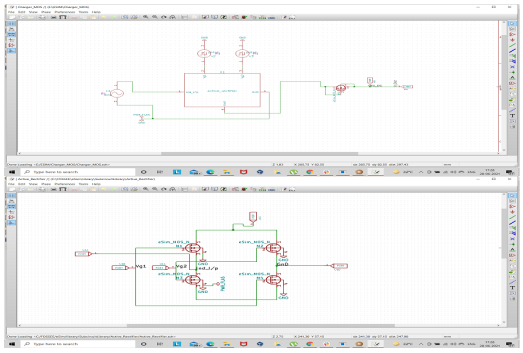

Figure 1: Implemented circuit diagram.

3 Implemented Waveforms

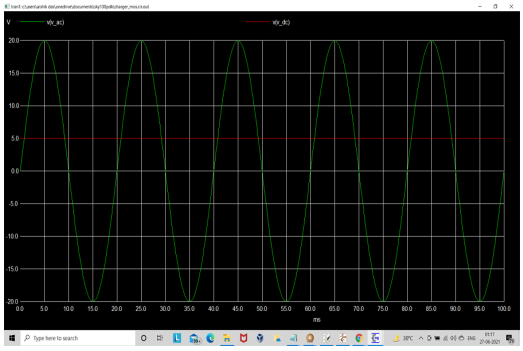

Figure 2: Implemented waveform.

References

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