

# Lab Report

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## CONTENTS

**Abstract**—This manual provides procedure of making a charger.

## AIM OF THE EXPERIMENT

In this experiment we made a charger of output 5V by using the circuit given in the report. we used different equipments and electrical devices to change the input of 220V AC to 5V DC.

## MATERIAL REQUIRED

1. Solderless Breadboard
2. Printed Circuit board
3. Transformer(12-0-12)
4. 4 IN4007 diode
5. capacitor(100 $\mu$  F)
6. 7805 Regulator
7. Output point
8. AC cable with a plug.
9. Multi-meter
10. Cathode-ray oscilloscope
11. USB cable

## CIRCUIT EXPLANATION

The transformer steps down the 230V AC main supply to 12V AC. Note that these are RMS voltages. The peak voltage will thus be  $12\sqrt{2} \approx 18V$ . The transformed voltage is given by

$$v(t) = 12\sqrt{2} \sin(100\pi t + \phi)V \quad (0.1)$$

## PROCEDURE

After collecting all the material required we started arranging the transistor, capacitor and diode in a proper manner as shown in circuit. Firstly we connected transformer so as to convert 230V to

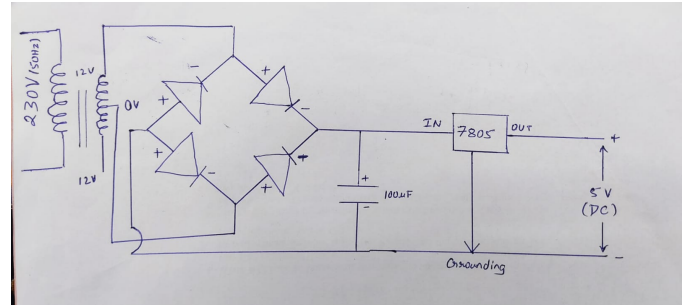


fig.1 Circuit diagram of charger

12V. Then after fitting remaining material in breadboard we measured the output using multimeter.

Since we had got the correct output i.e. 5V so we removed the electrical equipments from the breadboard and arranged in the POC in the same arrangement as it was in breadboard. After that we did soldering using solder iron and solder wire. Since the remaining wire was harmful and of no use so we removed them.

## OBSERVATION

We have checked that the output we are getting is 5V so to verify it again we again checked it with cathode ray oscilloscope (CRO). Again we got the same reading as multimeter. After this we measured the voltage across half wave rectifier whose result is there in fig.2.

## RESULT

Now after doing all the observations we have become ready to charge our Mobile phone. For that we attached a USB (Type C) cable to the output point. On connecting the USB cable to the mobile phone and switching on the main supply to which the transformer is connected, we can see that the mobile phone is getting charged successfully.

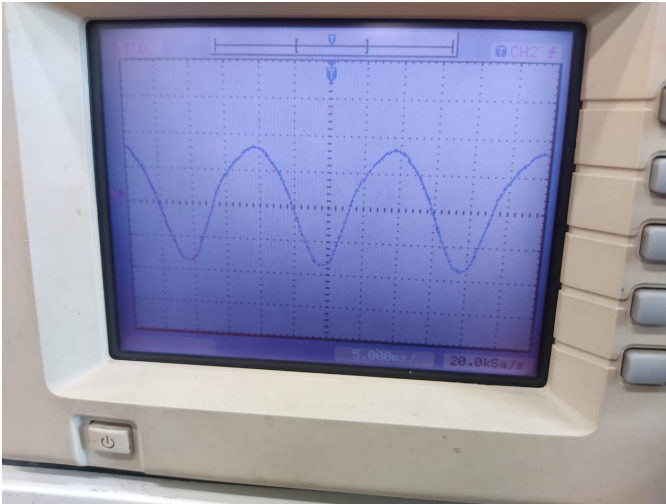


fig.2 CRO output of transformer

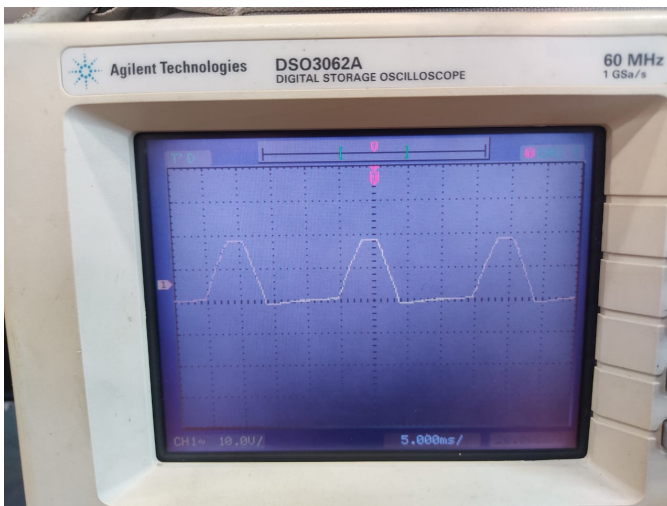


fig.3 CRO output of half wave rectified voltage across diode

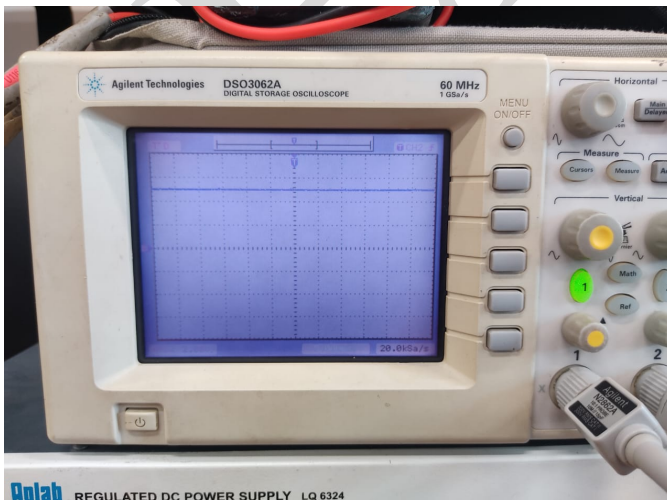


fig.4 CRO reading of main output of charger