

UBIQUITOUS CHARGING OF SMART PHONES

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Abstract - The main idea behind this protocol is conversion of junk data into current for charging smart phones. Because of the hike of bigdata, junk data are produced at a higher rate. The junk data is given as an input to the digital input pin of arduinouno, where it is coded in order to convert bit 1 into 5 volts and bit 0 into 0 volts. Thus the generated 5 volt from the analog pin of arduinouno is amplified using transistors in a bread board. The amplified AC voltage is then converted into DC voltage. Thus the obtained DC voltage is used to charge smart phones. For working of arduino and bread board, an external rechargeable battery is provided. The amplified output current produced is given to the smart phone for charging and to the external charger.

I. INTRODUCTION

The protocol being developed is aimed to provide current to charge smart phones anywhere and at any time. The main idea behind this is the conversion of junk data, which is generated by every single user due to the hike of bigdata, into current. The conversion mechanism involves the production of voltage using arduinouno and then current in bread board. Additionally, some hardware and circuit connections are involved for efficient delivery of current.

II. JUNK DATA INTO VOLTAGE

Technological rise results in the wastage of some useful resources until it is identified as useful. Junk data, which is the by-product of every single internet usage is kept unused. Our concept is to make use of those junk data to produce a commercial electronic device. The junk data includes photos, videos, documents, music, etc that you use via your internet in your regular basis. A video taken for 2 minutes in our smart phone is also considered to be a junk data. There are many languages used for extracting junk data. We are using python language for deriving it. Extracting different types of junk data (photos, videos, and documents) involves different procedures in python code. Therefore, for efficient delivery of current, we focus on extracting junk videos. Thus, as a result, the junk data are driven using python code and it is sent to the electronic device we are making through USB cable. All versions of USB cables have 2 set of wires: one set (gnd,vcc) that supplies power to peripherals and another set is responsible for transferring data between host and that device. All data are a collection of 0's and 1's. The junk data extracted is given as an input to the digital pin of arduino using a USB breadboard adapter. USB breadboard adapter has 2 set of pins. One pair is for transferring power supply while other is to transfer data. The USB breadboard adapter is connected to the breadboard. In the USB port of USB breadboard adapter, the USB cable from smart phone is inserted.

The USB breadboard reader acts as a connector between smart phone's USB cable and arduino. The output from the data pin of USB adapter is given as an input to the digital pin of arduinouno. The arduino is programmed in such a way that it produces 5 voltage on every input of bit-1. That is, arduino is programmed in order to convert every incoming bit-1 into 5 volt and bit-0 as 0 volt. Since all data are a collection of 0's and 1's, combination of 0's and 1's will be the input for arduino. Thus for ever bit-1 on the input stream will produce 5 voltage. It is supplied with a 5V battery power from the rechargeable battery. The output from arduino is taken from pins. The gained voltage is then processed to produce current.

III. AMPLIFICATION

Amplification is a simplest way of increasing the output voltage using amplifiers. Because amplifiers have the ability to increase the magnitude of an input signal, it is useful to be able to rate an amplifiers's amplifying ability in terms of an output/input ration. The technical term for an amplifier's output/input is gain. A common emitter amplifier is used as a voltage amplifier. For our convention, we have used a 2N3904 NPN bipolar transistors. The 2N3904 transistor is a common NPN bipolar junction transistor used for general purpose low-power amplification. The gain from this transistor is much larger compared with other transistors. The base of the 2N3904 transistor is connected to the 470Kohm resistor. The collector is connected with the jumper. When the output 5 volt is passed to the circuit connection, it produced a higher gain. Voltage gain is measured as:

$$A_v = V_{\text{output}} / V_{\text{input}}$$

When an input of 5 volt is given, it produced 345 gain. The voltage amplifier circuit setup is shown in the fig.1. In the fig.1, the output from the arduino is given instead of using battery.



Fig.1

IV. AC VOLTAGE TO DC VOLTAGE

AC is used to transmit power over long distances. The power we get from electrical outlets in our home is AC power supply. However, our smart phone uses dc at some level, we have to convert the AC voltage into DC voltage. A regulated power supply system can be assembled to electrically convert high-voltage alternating current to a fixed direct current in a series of steps. This process involves converting the varying AC voltage to a pulsed, single-direction DC voltage. The pulsed current is then smoothed and regulated to produce a fixed DC output. We can use this using a full-wave bridge rectifier. The full-wave rectifier is shown in fig.2. The transformer can be used to step down the ac voltage supply, which is the outlet from the amplification portion. The reduced voltage from the transformer now goes through one of the diodes. During the positive part of the cosine cycle of the AC voltage the current flows through D2 and D3. During the negative half, the current flows through D1 and D4. The AC input voltage fluctuates usually with a known frequency. We must choose our resistor R1 and capacitor C1 such that the product of the resistance and capacitance is much greater than the half the period of the input wave.

$$R * C \gg T/2$$

Where T is the time period of the input wave. Now we have the rectified AC voltage. The design setup is shown in the fig.2

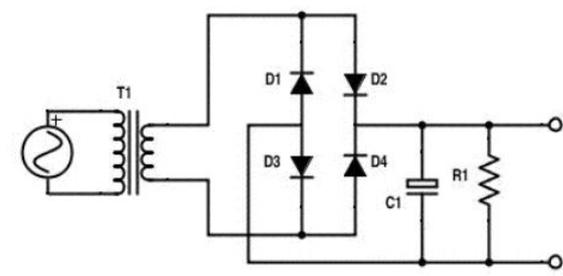


Fig.2

V. RECHARGEABLE BATTERY

The output power thus obtained is divided into two outputs. One for charging smart phones and other is for charging our 5V rechargeable battery. Arduino is

operated using this 5V battery. A normal rechargeable battery is used for our purpose. For recharging it, some amount of power supply obtained from junk data is given.

VI. OVERALL DESIGN

The overall design is shown in the fig.3.

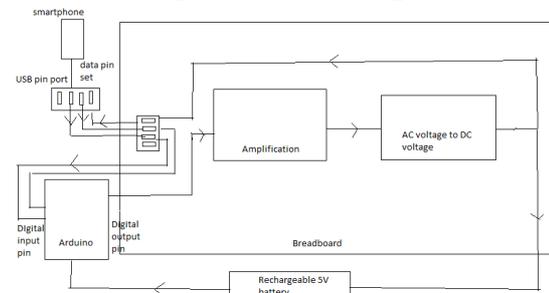


Fig.3

CONCLUSION

In this contemporary world, mobile phones has become a major part of our life. The ultimate backbone of mobile phone is its charge. Thus using this module, mobile users will be benefitted without any worry about electricity.

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