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# AMBIENT POWER GENERATOR USING MOBILE SIGNAL

M.FLORENCE SILVIA[1]
S.KARTHIK[2], R.NITHISH KUMAR[3], V.K.SRIVATHSAN[4]

[1]*Asst. Prof, Department of Electronics and Communication Engineering,*
[2,3,4]*Student, Department of Electronics and Communication Engineering,*
*JEPPIAAR SRR Engineering College, Padur, Ch-603 103.,*

**Abstract:** *In day to day life,the need of energy is increasing. In India, in recent years (2015-2016) the average power consumption is 1075 kWh per capita.This concept is not going to deal with large scale. The energy is in various forms and the energy can be generated from sources like wind, solar, vibration, heat, radio frequency (RF).This concept deals with the mobile signal. This RF energy can be an alternative to existing energy resources. RF / mobile communication in developing country like India has made RF energy harvesting as an attractive solution to the increasing energy needs. Most of the energies are released into the environment and they are wasted. The RF signals can be harvested and it can be used as an energy producer for the devices. Hence, the technique conversion of RF to a DC power in-order to produce energy for the devices is done. The production of the energy power can be used to main purpose of mobile charging and it can be used as a back-up charger and it can be used further.*

***Keywords:*** *RF to DC, Mobile Charging, Energy harvesting.*

## I. INTRODUCTION

The power produced is at range of 3.3~3.7 v which is useful for charging of the mobile devices. The study of the receiving the RF/ Mobile signal was done in [1]. The main concept details was experimentally studied over [2]-[4]. In [2], they used the C-MOS Technology for the conversion of the RF signal. But the module occupies a huge area and produces heat. This module is a portable device which works with help of Microcontroller AT89S52 and it can be carried over any place. In future, this module can be minimized and made compact to be fit in Mobile.

## II. ARCHITECTURE OF AT89S52

The AT89S52 is a low-power, high-performance, 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high density,non-volatile memory technology.

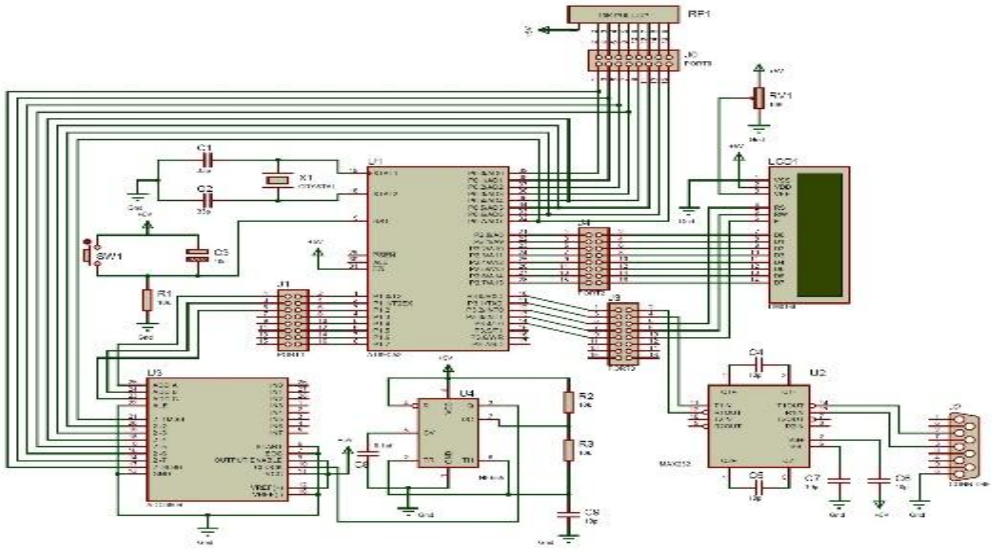

Fig.1 Architecture of AT89S52

**Features**:

- 4.0V to 5.5V Operating Range.
- Fully Static Operation: 0 Hz to 33 Mhz.
- Three-level Program Memory Lock.
- 256 x 8-bit Internal RAM.

 

- 32 Programmable I/O Lines.

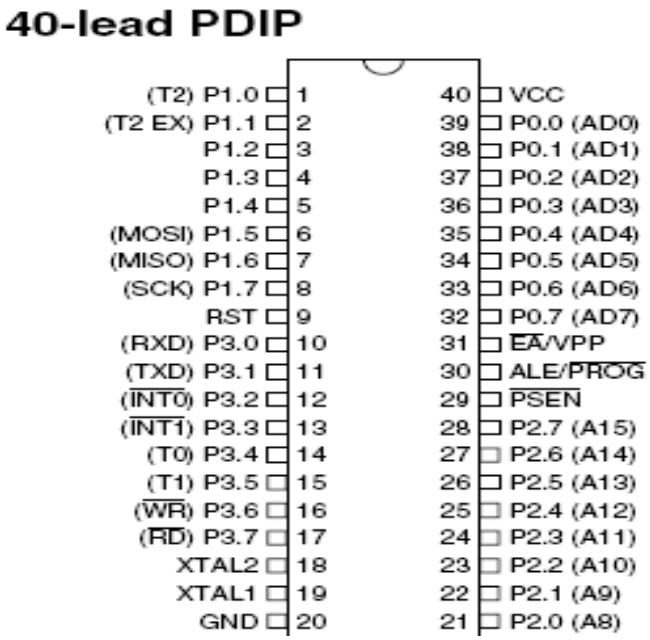


Fig.2 Pin Configuration

This microcontroller contains 40 pins, and accepts only digital values. There are four ports namely P1,P2,P3,P4.The ODD ports (P1,P3) on the left side of the controller and the EVEN ports (P2,P4) are on the right side. 32 pins for general purpose and 8 pins for special purposes.

## III. BLOCK DIAGRAM

The block diagram of the module is shown as per fig. 3

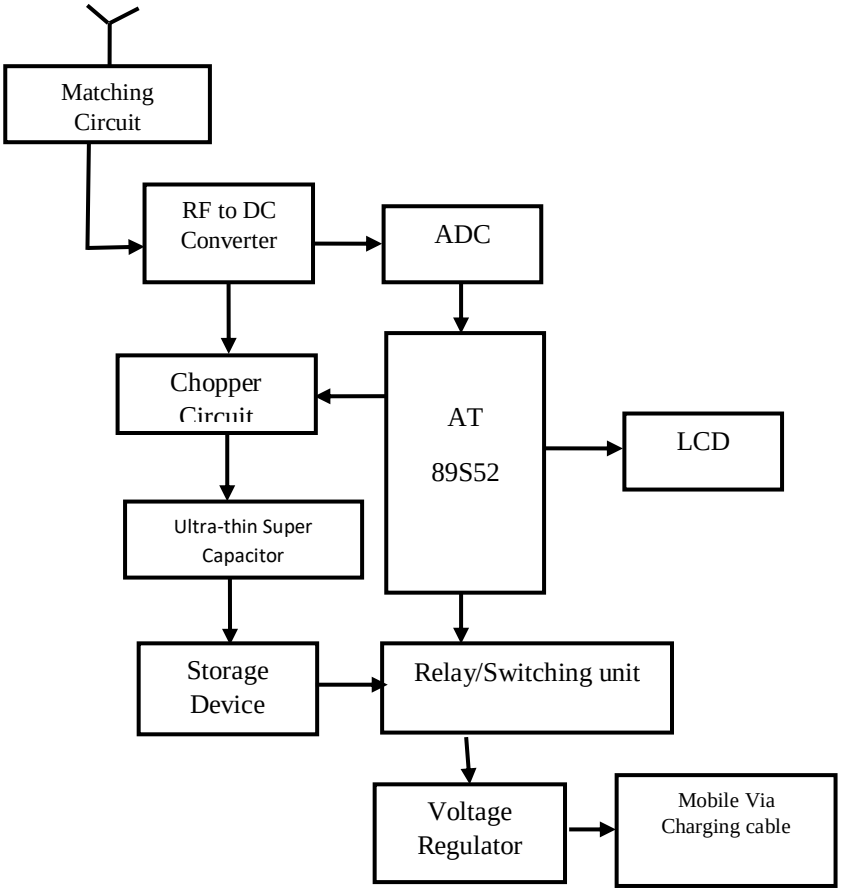


Fig.3 Block Diagram

 

Fig.3.1 Photographic View

## IV. BLOCK DIAGRAM DESCRIPTION

### *4.1.*RF to DC converter

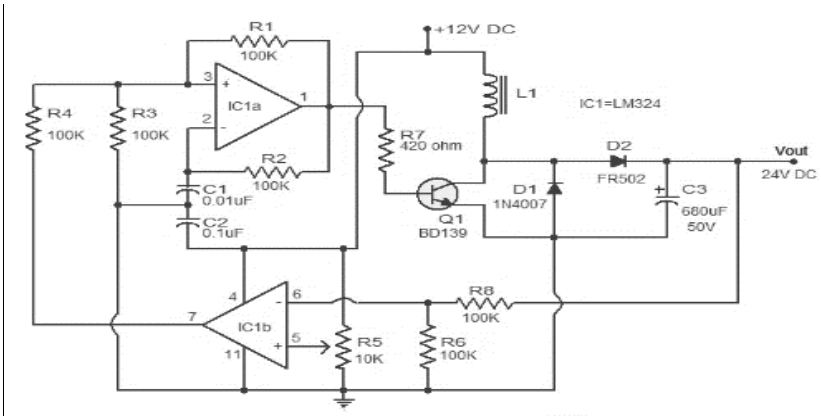


Fig.4 RF to DC converter

This RF to DC converter receives the radio frequency signals when making calls. This RF signals collected by the MATCHING CIRCUIT , the antenna present in it receives the radio frequency signals and send those signals to the RF to DC converter. This conversion gives us the power only in mV(milli volt),hence to boost up the power CHOPPER CIRCUIT is connected.

### *4.2* .Chopper circuit

The work of **chopper circuit** is to boost up the received power and convert it to the high power output eg: if the input power to the copper circuit is 0.8Mv and the output power is received as 3.7v which is required for mobile charging.

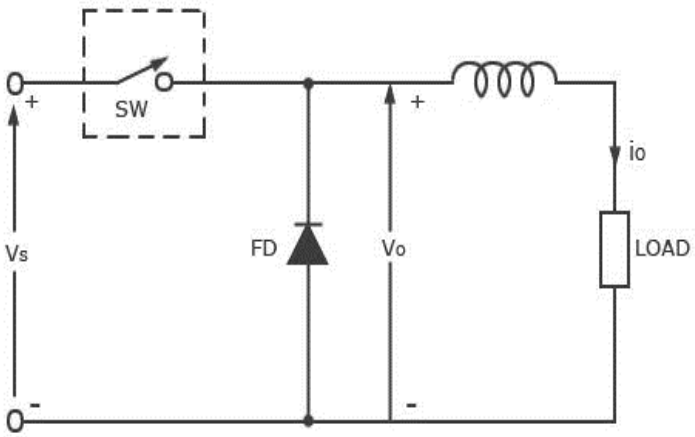


Fig. 5 Chopper Circuit

 

### *4.3.* Ultra-Thin Super Capacitor

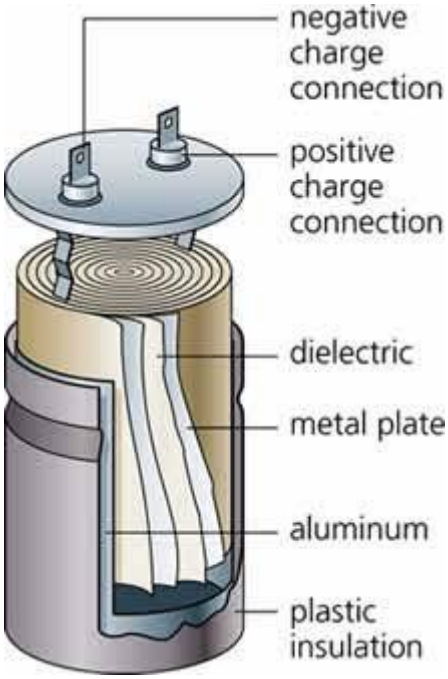


Fig.6 Ultra-Thin Super Capacitor

The need of using a **ULTRA THIN SUPER CAPACITOR** instead of using a normal capacitor is this Super Capacitor Cannot discharge easily where the normal capacitor cannot. Instead of a lithium or lead battery this ultra thin super capacitor can be used.

### *4.4* .ADC

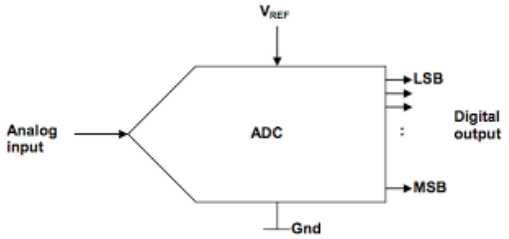


Fig.7 ADC

The need for ADC is the microcontroller only accepts the digital values its does not accepts the analog information's, ADC program coding is debugged into the ADC processor this converts the analog values to the digital .

### *4.5* . RELAY UNIT


Fig.8 Relay Unit

Relay is a electrically operated switch. Many relays use an electromagnet to mechanically.Such relays are mostly used in TRANSRECEIVERS which combine transmitter and receiver in a single unit. The relay unit that used here is able to switch the module ON and OFF.

 

### *4.6.* LCD

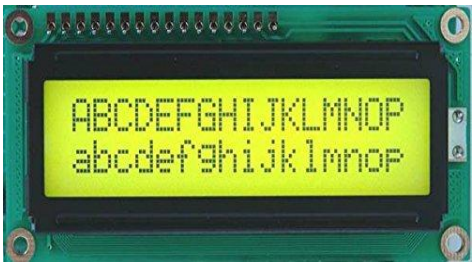


Fig.9 LCD

The LCD used 16x2 LCD display. The need for LCD is to show the amount of power that has received by the antenna and how much of power has stored in the battery. LCD is used to see how much RF signal is collected and how much is stored to the battery. Every power conversion is seen through the display.

### *4.7.* VOLTAGE REGULATOR

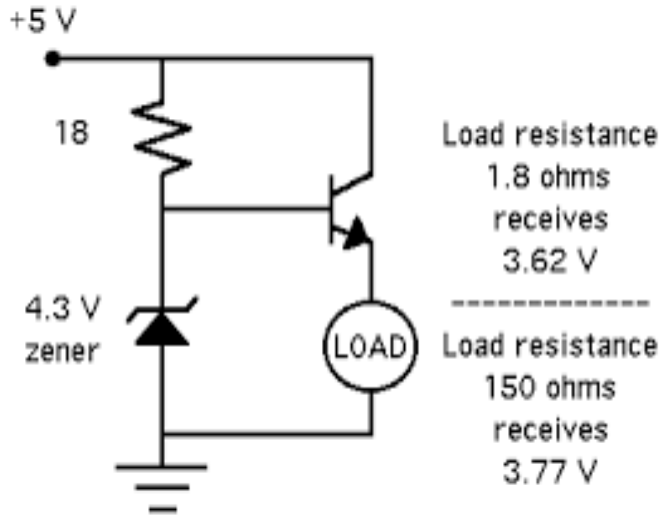


Fig.10 Voltage Regulator

Voltage regulator reduces the high power and convert it to the voltage capable for mobile charging. The charging voltage of mobile phones is **3.7V**. if voltage regulator is not used the mobile phones cannot able to charge it may able to blast or do some malfunctions.

## V. WORKING CONCEPT

The simplest concept of this module is **"The mobile gets Charge, when here make calls"**.The Mobile works over the RF signal. In this module, the matching circuit traps the RF signal while making calls as shown in Fig.1. The trapped RF signal is converted to DC signal. But the obtained conversion is not as much efficient for charging the mobiles. So, Chopper Circuit is used which is nothing but a DC to DC convertor. The purpose of the Chopper Circuit is to boost up the Voltage from mV to V (millivolt to Volt). It cannot directly connect it to the mobile phones because there will not a constant power supply to the mobile. So, battery is used which stores the power which is converted. From the battery, relay switch and voltage regulator is connected which gives constant supply of 3.7V which is needed for the mobiles. This over all function is controlled by the microcontroller AT89S52.

The microcontroller accepts only Digital values for the operation. So, ADC (Analog to Digital Convertor) is used to convert from Analog to Digital. This LCD display gives the information of the power obtained and supplied to the mobile.

## VI. RESULT

There by, in this module here trap the RF signal which is vast available and convert it for the charging purpose for day to day life. This purpose of this application can be also useful for other purposes and used as power backup.

 

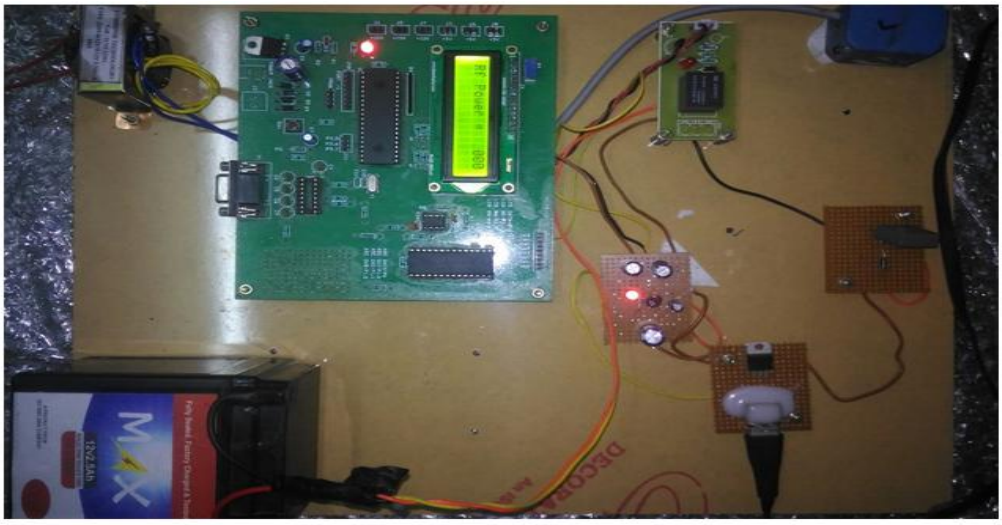

Fig.11 At ON state while no RF signal is detected.


Fig.11.1 Due to incoming call RF signal is detected.

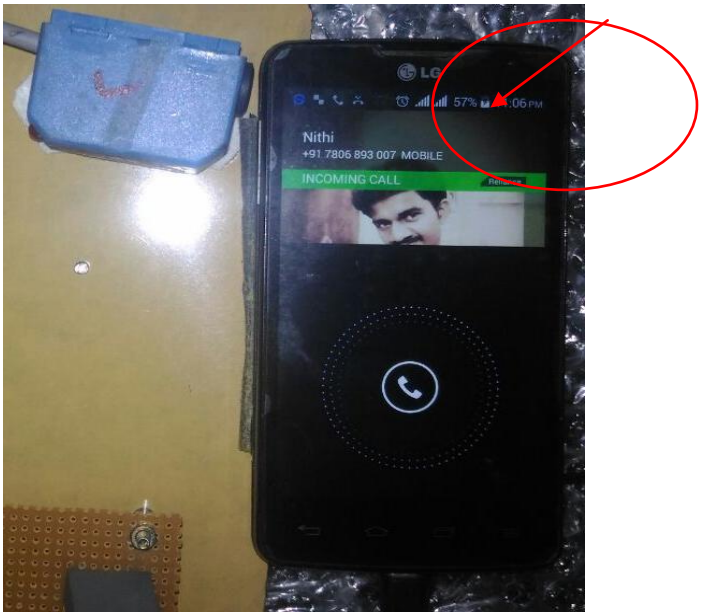


Fig.11.2 The received RF is converted to DC and the mobile phone is CHARGING.

 

## VII. ACKNOWLEGMENT

Here by,we have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. We would extend our sincere thanks to JEPPIAAR SRR ENGINEERING COLLEGE.

## VIII. REFERENCE

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