

# Wireless charger for mobile

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**Abstract:** The main objective of wireless charger is to charge the mobile by wireless power transmission. The dream of wireless charging is just to be able to plop your phone on a shelf after work and have it fully charged when you pick up it on your own out. This technology will replace the cables, potentially being able to adjust the power settings to charge the different type of batteries. Wireless charging may replace the plugs, cables and similar to how wi-fi, blue tooth have modernized personal communication. Consumers are wild about the convenience of simply placing a portable device on a charging mat.

## I. INTRODUCTION

This system demonstrates the concept of wireless mobile charging system. The system allows user to wirelessly charge his mobile phone without plugging in the mobile adapter. We demonstrate the system using a charging pad where user just needs to place his adapter circuit to charge the mobile phone. For this purpose we utilize the advanced power transfer concept. For this purpose we use a high frequency transformer to convert mains input 230V AC to 12 V DC. This output is supplied to the charging pad coil. When the adapter coil comes in range of the charging pad coil, the power is transferred wirelessly to the receiving coil and this 12 V dc is provided to the adapter circuit which is used to convert this 12 V DC to 4.2V DC which is then supplied to the mobile phone.

## 2. CIRCUIT DIAGRAM

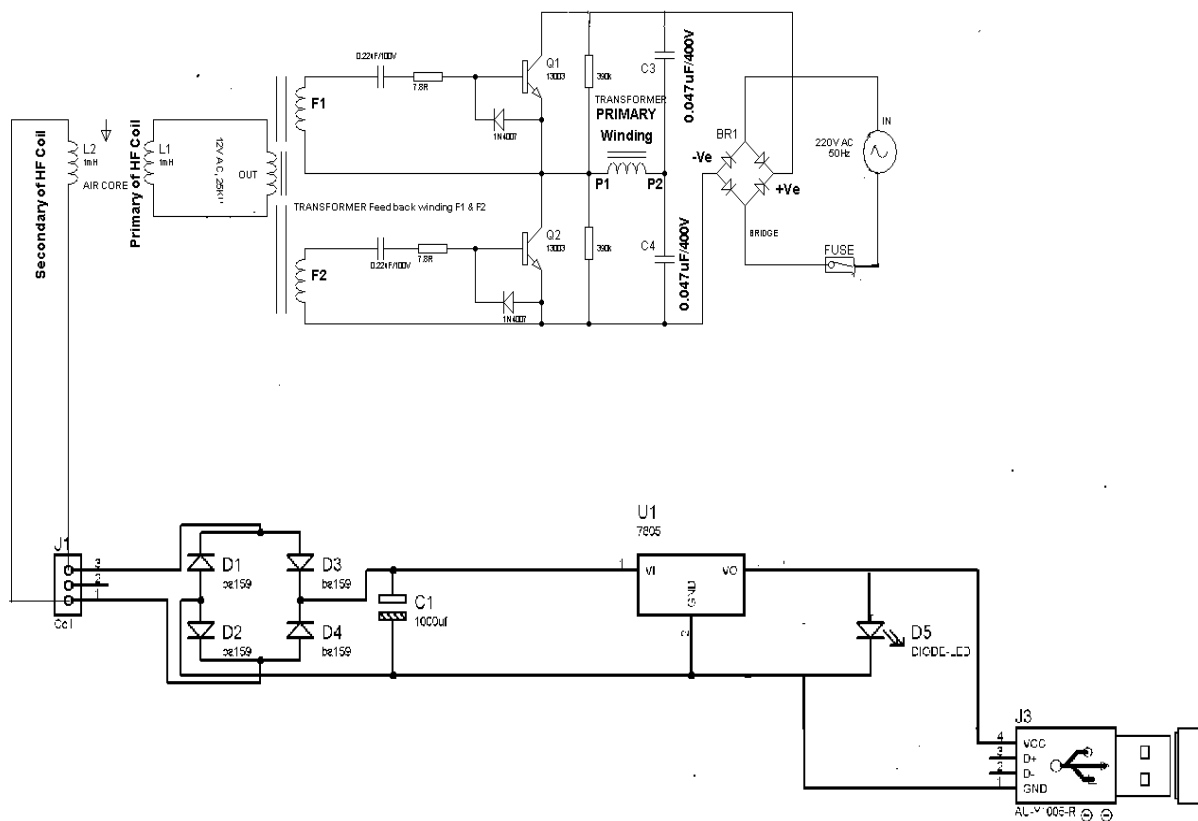


Fig 1 –wireless mobile charger circuit diagram

## DISCRIPTION

### 2.1 HIGH FREQUENCY TRANSFORMER

The above circuit having high frequency transformer. It works on half bridge and double line frequency. The current flowing in the primary coil both the cycles and generates ac in secondary coils. As transistors as fast switching devices frequency of ac becomes 25KHZ to L2 by means of EMF ( transformer principle).

2.2 RECTIFIER CIRCUIT

Voltage induced L2 coil is fed to 4 diodes forming a Bridge Rectifier that delivers dc which is then filtered by an electrolytic capacitor of about 1000microf. The filtered dc being unregulated IC LM7805 is used to get 5v constant at its pin no 3 irrespective of input dc varying from 9v to 14v.

The regulated 5volts dc is further filtered by a small electrolytic capacitor of 10 micro F for any noise so generated by the circuit which can be used for battery charging. One LED is connected of this 5v point in series with a resistor of 330ohms to the ground i.e. negative voltage to indicate 5v power supply availability. The 5v dc is used for other applications as on when required. The output of bridge rectifier i.e., +12V is taken to drive the 12V DC .

3. Block Diagram:

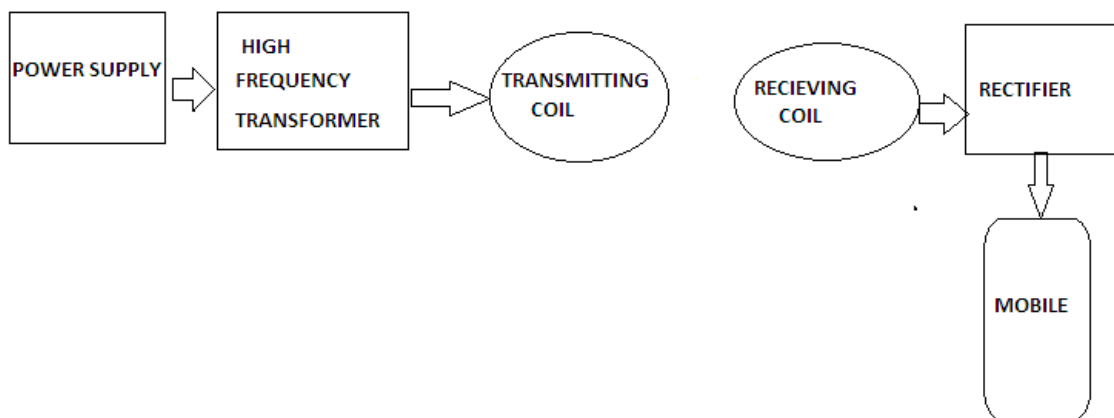


Fig -2: Block Diagram of wireless mobile charger

Here we propose wireless mobile charger by using inductive method. The block diagram shows the components which we are used. It is work on the principle of mutual inductance. The high frequency transformer over come the draw backs of the electrical transformer. By using this method we can charge the mobile any where. This is used for only small distances. The energy is transferred between the transmitter and receiver coils by means of mutual inductance.

4. HARD WARE OUTPUT



Fig -3 hardware output

4.1 Hard Ware Specifications:

Table -1: specification parameters

| S. No                             | Component                  | Ratings     |
|-----------------------------------|----------------------------|-------------|
| <b>HIGH FREQUENCY TRANSFORMER</b> |                            |             |
| i                                 | High Frequency Transformer | 230V, 50 HZ |
| ii                                | Diodes                     | IN4007      |

|                          |                   |              |
|--------------------------|-------------------|--------------|
| iii                      | Capacitors        | 0.047mf,400V |
| iv                       | Resistor          | 2K $\Omega$  |
| v                        | MOSFETS           | Q13003       |
| vi                       | Capacitors        | 0.22mf,100v  |
| vii                      | Diodes            | IN4001       |
| <b>RECTIFIER CIRCUIT</b> |                   |              |
| i                        | Diodes            | IN4007       |
| ii                       | Voltage regulator | IC7805       |
| iii                      | Capacitor         | 1000 $\mu$ F |

#### 4.2 RESULT

**Table -2 Experimental Results**

|                               | <b>TRANSFORMER<br/>OUTPUT</b> | <b>RECTIFIER<br/>OUTPUT</b> |
|-------------------------------|-------------------------------|-----------------------------|
| <b>Theoretical<br/>values</b> | 12V                           | 5V                          |
| <b>Practical<br/>values</b>   | 9.5v                          | 4.2v                        |

Input voltage :  $V = N \cdot d(\Phi)/dt$ . The equation for finding the inductance of a single layer air core coil

$$L = 0.001 \times 22 \times (0.165/2)^2 / ((114 \times 0.165) + (254 \times 0.085)) \text{ H}$$

$$L = 0.674 \mu\text{H}$$

For receiver coil

$$L = 0.001 N^2 (a/2)^2 / (114a + 254) \text{ H}$$

$$L = 0.001 \times 32 \times (0.08/2)^2 / ((114 \times 0.08) + (254 \times 0.01)) \text{ H}$$

$$L = 1.235 \mu\text{H}$$

#### 5. CONCLUSIONS

It is very efficient, there has been little development made in the field of wireless electricity since the idea was first floated by NIKOLAS TESLA around 100 years ago. A world free electric cables is distant dream a yet hope for the future that would be eco friendly and free of hazardous fuels like carbon and nuclear keeps us going. The concept of wireless energy transfer which has results in a funding into the projects. Since the smart phone is available for communications. one of the vision we have NFC RFID in the phone provide the local power company with billing information so that they can charge your credit card. Wireless charging more practical and more useful. The reason rapid high rate charging is linked to wireless charging an assumption that if you can recharge battery in just a few minutes, you can get multiple devices during the day.

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