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SMART WIRELESS MOBILE CHARGER

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Abstract- Wireless charging is a technique of transmitting power through an air gap to an electrical device for the purpose of energy replenishment. This concept demonstrates the principle of inductive coupling. It allows users to charge their mobile phones wirelessly. The system is demonstrated using a charging pad where users just need to place their adapter circuit to charge the mobile phone. For this we need to use A high frequency transformer used to convert mains input 230V AC to 12 V DC. Then that output is supplied to the charging pad coil. When the adapter coil comes in range of the charging pad coil, the power is thus 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 5V DC and then it supplied to the mobile phone. So this allows us to charge the mobile phone wirelessly without plugging it in.

Index terms : Inductive Coupling, Mobile Phone , Adapter , Transformer

I. Introduction –

Today, electricity plays a vital role in our mandatory life. As we are using many numbers of appliances using electricity. Wireless Power Transmission has emerged as the technology in the recent days , where the electrical power is transmitted from one place to another without the use of wires. The main theme behind Wireless power Transmitter is to get rid of the risky usage of the wires. For an example, the portable electronic devices including mobile phones, tablets, laptops, household robots, drones and etc normally relies upon the battery power.The main problem that we identify to get this idea many people are facing with the wired communication and there will be no cut off because of improper feedback. There will be a heavy loss duty to wire and the wires may damage every time which has been common issue all over the world and the people are searching for the device that can resolve their issue to make easy way charging to the mobile phones.

III. Block Diagram

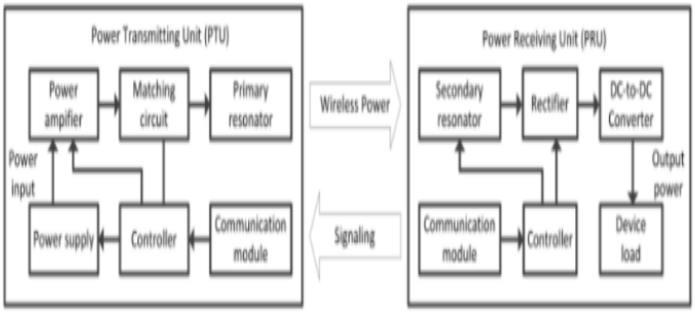


Fig. Block Diagram

Power transmission unit

Power transmission is the movement of energy from its place of generation to a location where it is applied to perform useful work. Power is defined formally as units of energy per unit time.

Power Amplifier

A power amplifier is an amplifier designed primarily to increase the magnitude of a power of a given input signal. The power of the input signal is increased to a level high enough to drive loads of output devices like speakers, headphones, RF transmitters etc

Matching circuit

A matching network is connected between a source and a load, and its circuitry usually designed such that it transfers almost all power to the load.

Resonator

A resonator is a device or system that exhibits resonance or resonant behavior. That is, it naturally oscillates with greater amplitude at some frequencies, called resonating frequencies, than at other frequencies. The oscillations in a resonator can be either electromagnetic or mechanical.

Rectifier

A rectifier is an electronic device that converts alternating current, which periodically reverses direction, to direct current, which flows in only one direction. The reverse operation is performed by the inverter.

Battery

Battery, in electricity and electrochemistry, any of a class of devices that convert chemical energy directly into electrical energy. Although the term battery, in strict usage, designates an assembly of two or more galvanic cells capable of such energy conversion, it is commonly applied to a single cell of this kind. A battery generally consists of an anode, a cathode, and an electrolyte.

Fig. 2. Battery

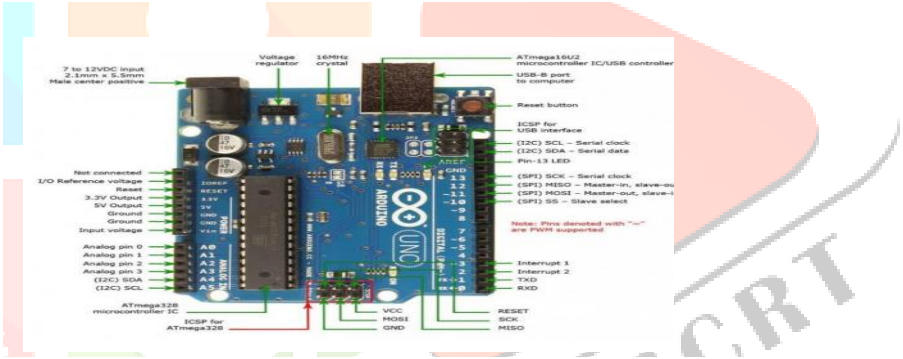
Coils

Coil, in an electric circuit, one or more turns, usually roughly circular or cylindrical, of current- carrying wire designed to produce a magnetic field or to provide electrical resistance or inductance; in the latter case, a coil is also called a choke coil. Electromagnetic coils are used in electrical engineering, in applications where electric currents interact

with magnetic fields, in device such as electro motors, generators, inductors, electromagnets, transformer, and sensor

Arduino uno

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc . The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits. There is a built-in LED driven by digital pin 13. When the pin is high value, the LED is on, when the pin is low, it is off. The input voltage to the Arduino/Genuino board when it is using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin. This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 20V), the USB connector (5V), or the VIN pin of the board (7-20V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage the board. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA. This pin on the Arduino/Genuino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source, or enable voltage translators on the outputs to work with the 5V or 3.3V.Typically used to add a reset button to shields



that block the one on the board. Each of the 14 digital pins and 6 analog pins on the Uno can be used as an input or output, under software control (using pinMode (), digitalWrite (), and digitalRead () functions). They operate at 5 volts. Each pin can provide or receive 20 mA as the recommended operating condition and has an internal pull-up resistor (disconnected by default) of 20-50K ohm. A maximum of 40mA must not be exceeded on any I/O pin to avoid permanent damage to the microcontroller. The Uno has 6 analog inputs, labeled A0 through A5; each provides 10 bits of resolution (i.e. 1024 different values). By default, they measure from ground to 5 volts, though it is possible to change the upper end of the range using the AREF pin and the analog Reference () function.

METHODOLOGY

Half bridge and Dual line frequency are responsible for the working of transformer. With the help of bridge rectifier, the AC current is converted into dc .by capacitor and Resistor it's charged, In Q1 i.e (Collector – Emitter) conduction starts, Biasing was provided by F1 to Q1 Transistor. The current passes from p1 to p2 of primary coil. And the current reaches ground after passing through C4 capacitor. In another half cycle Q2(collector to Emitter) conduction will start and Transistor will be provided with biasing By F2. The Electricity flow through C3 and P2 to P1 reaches Q2 and then negative. so in one half cycle flow of current it is from P1 to p2, in another half cycle flow of current it is from P2 to P1.F1 and F2 will be biased automatically. it can't be determined which coil gets bias first, so Ac will be generated in secondary coil when current flows through the primary coil. The frequency of Ac will be 25 KHz as all the transistors were fast switching Devices, this will be attached to L1. Coil winds i.e coils of copper which were connected to Secondary one. EMF will be used for transferring the 25KHZ Ac from L1 to L2, Bridge rectifier will be formed by four Diodes Which were fed by L2(Volatge Induced) which will be delivering dc and a 1000 microfarad Electrolytic Capacitor will be filtering the Delivered DC. IC LM7805 will be play a vital role in maintaining the Voltage constant at 5v at 3rd pin regardless of the fluctuating voltage between 9 to 14 V. The generated 5 volts will

be furthermore filtered for eliminating the noise which was generated by circuit. And this can be used for battery charging. A led will be connected to 5v source in series with 330 ohms resistor to the negative terminal which will be used to show the availability of the Power supply. Bridge Rectifier's output +12 v is used to drive DC 12V.

CONCLUSION

Wireless charging technologies will be the future as the Electronics devices usage like Mobile phones and wearables and headphones have grown enormously and the consumers are seeking for convince. and want to have a hassle-free experience. Our project goal is to create a wireless charger, with a max power output of 5 volts. And there is possibility of modifying the upper end Using AREF pin and a Analog reference () func. And Resonance inductive coupling (Magnetic Resonance Coupling). This Mechanism is robust and reliable for wireless charging of the supporting**.** In proposed system we use circuit and sensors, it gives proper feedback form receiver to transmission side. That feedback control the transmitter side, it helps to reduce electronic devices. Some open Issues regarding Wireless charging technologies along with Data communication are summarized priorly.

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