SMALL GENERATOR IN TO THE COVER

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ABSTRACT: *This paper is about capturing and converting as many different energy sources into electricity. Because we are dependent on gadgets and especially mobile phones, which have a limited duration due to lack of stored energy, the idea is to come up with a source that can produce an amount of energy from the resources found in the environment. This generator incorporates several energy sources, such as from the sun, motion, sound, signal.*

KEY WORDS: *mobile phones, gadgets, green energy, movement, sun*

1. INTRODUCTION

The expansion of mobile telephony is still growing and developing. Portable mobile systems have become so advanced that they completely replace classical computing systems, such as computers. Computer systems mainly manage to have high-performance systems for computing, processing information and storing it.

The processors with which the mobile phones are equipped have reached frequencies of 3GHz, with an impressive number of 8 cores, ram memories that reach up to 16 gb. All these performances come with a high need for electricity consumption. We try to make batteries with capacities as large as possible but they are limited in volume and weight, but we manage to charge quickly, so that in a short break you can charge it and then take it and continue your work.

Systems have been developed in the prototype phase to transmit electricity in the air at a frequency of over 5 GHz, and through special reception antennas you can maintain a constant charge of the devices. Fig. 1 shows the concept with a single transmitter you can charge multiple devices.

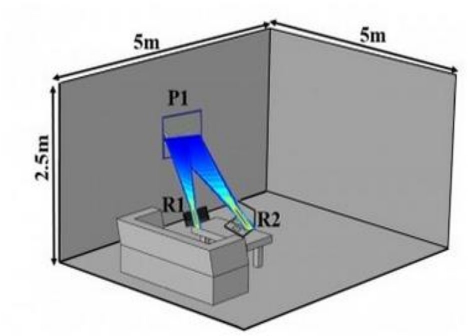

Fig.1 3D wireless charging

The ability to safely target focused microwave energy beams to charge certain devices while avoiding unwanted exposure to people, pets and other objects is a game changer for wireless power. And we are looking for alternatives to liquid crystals that could allow energy transfer to much higher power levels over longer distances.

Some wireless charging systems already exist to help power speakers, mobile phones and tablets, but these technologies are based on platforms that require their own wires and the devices must be located in the immediate vicinity of the charging station.

The magnetic near-field approach is not an option for power transfer over larger distances. This is because the coupling between source and receiver — and thus the power transfer efficiency — drops rapidly with distance.

2. THE PROPOSED SYSTEM

The proposed system is one on which to capture various energies and convert them into electricity, all in order to extend the life of the mobile phone. Obtaining electricity is done from several resources, present in fig.2, such as:

-Photovoltaic panel
- In motion, the piezo electric lamella
- Microphones
- Signal antennas
- Thermal potential difference

Fig.2 Generator system assembly

In the back, which is directly exposed to light, we have placed the photovoltaic cell. For the system we chose a monocrystalline photovoltaic cell, which has the highest efficiency per cm2. Within the system, the cell develops a voltage of 12V and a current of 120mAh, which can ensure a gain of electrical energy. The system can produce in ideal conditions an equivalent power of 1.44W, it is the highest power produced in the entire microgenerator system, because it is like the largest surface of all, it has a coefficient of conversion of sunlight into energy 20.4% electricity only by orienting it towards the sun.

For the conversion of motion into electricity, or of gravitational accelerations with a certain frequency actuated on the device, we chose to convert it with the help of a piezoelectric slide which is also present in fig.3. Converting a signal as large as possible, or having a wide range of application, we chose to apply an extra weight of lead on the outside, on the opposite side from the fixing side to create a much stronger vibration.

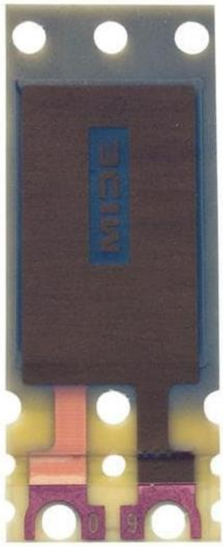

Fig.3 Piezoelectric slide

Just as the piezo lamella can convert movement into electricity, we chose so that noise, sound and it can be converted into electricity. Noise also with the help of analog microphones integrated in the device, but their production is quite small, but all combined can have a consistent contribution to the system to increase the amount of energy.

The piezoelectric effect converts mechanical strain into electric current or voltage. This strain can come from many different sources. Human motion, low-frequency seismic vibrations, and acoustic noise are everyday examples. Except in rare instances the piezoelectric effect operates in AC requiring time-varying inputs at mechanical resonance to be efficient.

Most piezoelectric electricity sources produce power on the order of milliwatts, too small for system application, but enough for hand-held devices such as some commercially available self-winding wristwatches. One proposal is that they are used for micro-scale devices, such as in a device harvesting micro-energy.

Through the piezo-electric slide we can accumulate somewhere at 120-160mW / h and through the system of microphones placed at the base of the hole we can reach somewhere at 50mW / h as energy produced.

For the conversion from thermal energy to electricity we need a peltier. We rely on heating the phone in use or heating the part with the photovoltaic cell, which can create a difference in thermal potential and thus be converted into electricity.

Ideal thermoelectric materials have a high Seebeck coefficient, high electrical conductivity, and low thermal conductivity. Low thermal conductivity is necessary to maintain a high thermal gradient at the junction. Standard thermoelectric modules manufactured today consist of P- and N-doped bismuth-telluride semiconductors sandwiched between two metallized ceramic plates. The ceramic plates add rigidity and electrical insulation to the system. To sum them up we need a controller that can convert all these waveforms into electricity, it is an energy harvesting system.

For the signal conversion part on each antenna model we chose a specialized P2110 circuit, which can generate up to 275mW / h of electricity from an antenna. The circuit diagram is shown in Fig. 4 which can supply up to 50mA output current at a voltage of 5.5V.

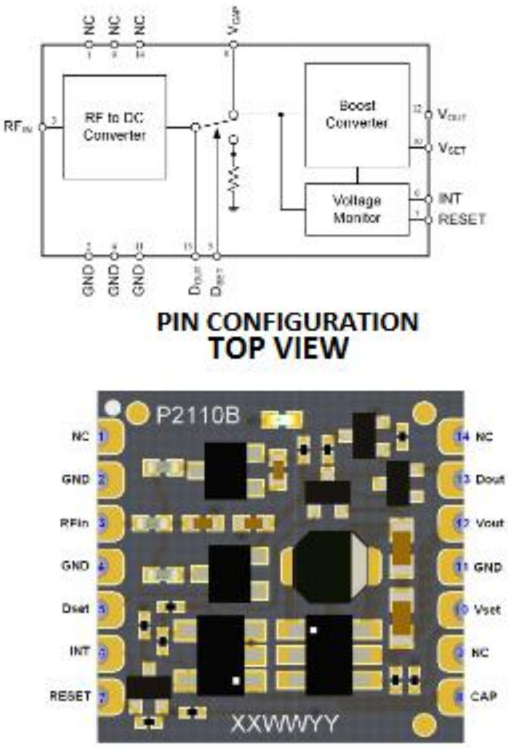

Fig.4 P2110 RF converter

The powercast P2110B is an RF energy harvesting device that convers RF to DC. Housed in a compact SMD package, the P2110B reciver provides RF energy harvesting and power management for battery-free, micro-power devices. The P2110B converts RF energy to DC and stores it iin a capacitor. When a charge threshold on the capacitor is achived, the P2110B boosts the voltage to the set output voltage level and enables the voltage output. When the charge on the capacitor declines to the low voltage threshold the voltage output is turned off.

The history of energy harvesting dates back to the windmill and the waterwheel. People have searched for ways to store the energy from heat and vibrations for many decades. One driving force behind the search for new energy harvesting devices is the desire to power sensor networks and mobile devices without batteries. Energy harvesting is also motivated by a desire to address the issue of climate change and global warming.

A possible source of energy comes from ubiquitous radio transmitters. Historically, either a large collection area or close proximity to the radiating wireless energy source is needed to get useful power levels from this source. The nantenna is one proposed development which would overcome this limitation by making use of the abundant natural radiation (such as solar radiation).

One idea is to deliberately broadcast RF energy to power and collect information from remote devices. This is now commonplace in passive radio-frequency identification (RFID) systems, but the Safety and US Federal Communications Commission (and equivalent bodies worldwide) limit the maximum power that can be transmitted this way to civilian use. This method has been used to power individual nodes in a wireless sensor network.

In general, energy can be stored in a capacitor, super capacitor, or battery. Capacitors are used when the application needs to provide huge energy spikes. Batteries leak less energy and are therefore used when the device needs to provide a steady flow of energy. Compared to batteries, super capacitors have virtually unlimited charge-discharge cycles and can therefore operate forever enabling a maintenance-free operation in IoT and wireless sensor devices.

3. CONCLUSIONS

In conclusion, the use of any resources as small as possible but gathered in a well-balanced system can contribute to an increase in the period of use of the mobile phone. Even if in a short time they show very low values, in time those mW collected from each system can supplement the waiting consumption of the phone or even charging a few percentages of the phone.

For the rear filter part, a small accumulator is used, which has a lung can in the entire system, the energy from the collection passes through it for the first time and then it goes to the user. Fig. 5 shows what the phone would look like on the integrated case.

Fig.5 The complete micro generator

4. REFERENCES

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