

Thermoelectric USB charger

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ABSTRACT

This paper describes a battery charger, that's powered via thermoelectric (TE) power modules. This gadget uses TE modules that at once convert heat energy to electricity to charge a battery. The traits of the TE module have been examined at exclusive temperatures. The objectives are to take a look at the principle of TE electricity generation and to layout and expand a TE battery charger that uses waste heat or any other heat supply as the direct input power.

I. INTRODUCTION

Currently in numerous urban areas, the electric-energy demand is growing which prompts the government to build new energy plants. Electrical power is essential for modern-day to day living. However, a few areas do now not have power and the citizens preference a number of the blessings and conveniences that electricity offers. Nowadays, the electrical electricity in faraway areas is generated on the whole with the aid of fuel motors. But, the majority accept as true with those turbines are too noisy, require an excessive amount of protection, and feature high gasoline costs. Renewable electricity, which includes sun energy, wind strength or hydropower is favoured, however it has limited use and is dependent on weather and topography. Thermoelectric can convert heat energy to electric energy without delay. Thermoelectric strength generation has the benefits of being preservation unfastened, silent in operation and related to no shifting or complicated parts.

II. RELATED WORK

In the past years, tons work has been reported about the TE electricity generator.

Killander [1] advanced a range-pinnacle generator the usage of two TE electricity modules, model HZ-20. During the operating time, the output of the generator was about 10W and provided the battery with a net input from 1 to 5 W.

Rahman [2] developed the thermoelectric generator to supply portable digital device or to rate a lap-pinnacle laptop battery. The generator is powered from butane gasoline; it has a capability energy output of approximately 13.5 W.

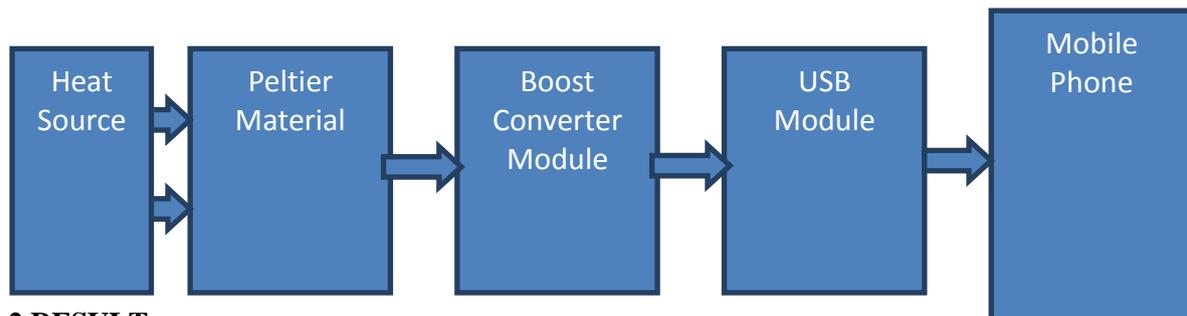
Roth et al [3] developed and examined a photovoltaic/thermoelectric hybrid machine as a strength supply for a cellular telephone repeater. The advanced gadget substances enough for fifty W everlasting loads.

III. PROPOSED WORK

Firstly, for Universal Thermoelectric Charger is using gas burner or candle supply to produce warmness electricity and burn without delay through the heat sink after which the voltage bypass through the

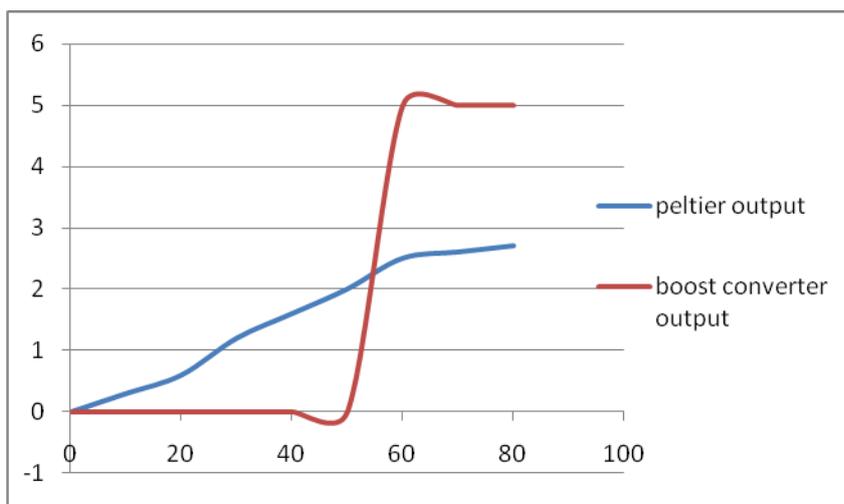
thermoelectric module and converted into electrical electricity. After that, some other cool sink is positioned at the pinnacle of TEC will be linked to circuit which contains of voltage divider and voltage regulator circuit. This circuit is combined collectively to make the circuit greater small and mild. At the same time, the voltage output from thermoelectric module could be energy down with the aid of first 5V through the regulated voltage called step-down circuit. This 5V from regulated step-down circuit will take a excessive voltage 9V until 12V and step it down to 5V. Thus, the 12V those pass via by way of the thermoelectric and connected with the cool sink will go with the flow through the voltage divider circuit. The feature of voltage divider circuit is design for upload on the protection thing to shield the tool. On the alternative hand, the voltage output from 5V regulated voltage step-down circuit is live consistent and solid for the output USB port. For the USB port is required 5V output to operate typically. In fact all USB gadgets need to be blanketed from excessive voltages to avoid damage or burn. So that, every other output is due to the tank of water that act as cool sink to make sure the temperature doesn't exceed the limits.

3.1 BLOCK DIAGRAM



3.2 RESULT

Heat versus Voltage graphical representation which shows the constant output above 60degree. This constant output is used to charge the mobile device using a USB module which regulates the output.



CONCLUSION

The advantage of the TE battery-charger machine is that the machine can charge the battery by way of using the warmth energy immediately. It may be implemented to heating devices which include a cook-stove, a boiler or

another heat supply for waste-heat recovery. This machine is the most viable to apply in a rural community or a far flung place. The photovoltaic system provides electrical power for the duration of sunshine, while the TE battery charger device affords energy as long as the heating tool is in use. The great energy output of the machine depends on the heat dissipation of the warmth sink. The purpose of this paper is to offer a brand new approach for generating electric power; the results derived here may additionally lay a basis for similarly investigations of TE battery charger structures.

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