Protopaja Summer course 2019
School of Automation and Electrical Engineering

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Energy Harvesting Bluetooth Low Energy Beacon

Objective

The objective is to power up a BLE module, using the harvested thermal energy of an LED driver.

Results

✓ Design a final circuit and PCB to boost from 0.3 V input voltage to 3.3 V output voltage

✓ Design an initial circuit and PCB to boost from 0.6 V input voltage to 3.3 V output voltage

✓ Powering up the nRF52840 Dongle with the final and initial PCB

✓ Generating 0.41 V at steady state through the dissipated heat of the LED driver, and air as coolant, using two thermoelectric generators as energy converter

✓ Mapping the connection of smartphones

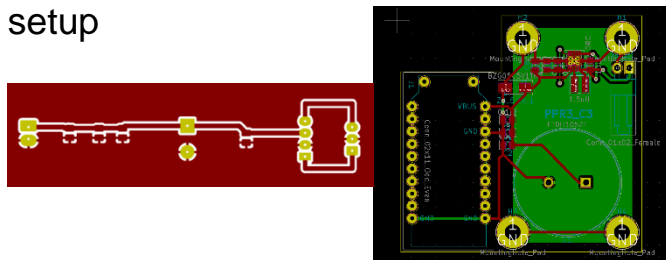✓ Mechanical design and implementation of the setup
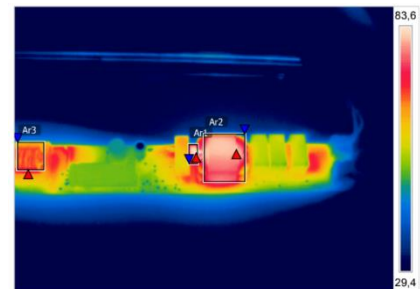

Fig 1. Initial and Final PCB Design
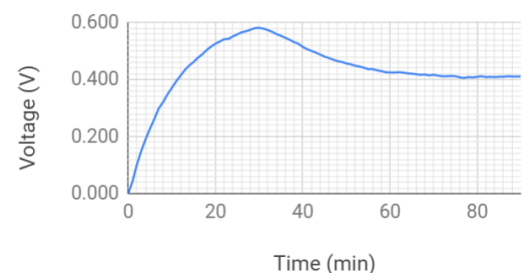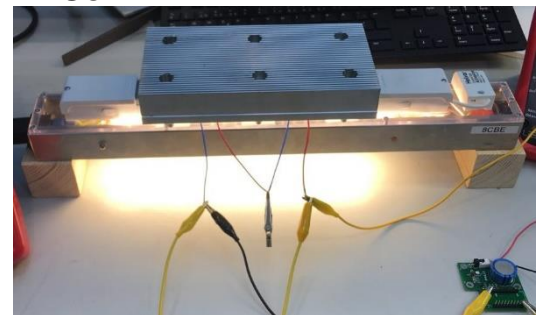

Fig 2. Thermal picture of LED driver

Fig 3. Voltage Generated by two TEGs

Fig 4. Setup

Fig 5. Final PCB

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