

Wake-up Harvester Design for Batteryless IoT System

sdmay21-14 (2/22 – 3/1)

Client & Advisor: Prof. Duwe

Team Members:

Edmund (Eddie) Duan - Powercast Harvester Team, Project Lead

Jacob Bernardi - MCU Team

Douglas Zuercher - Transceiver Team

Kwanghum (Ted) Park - MCU Team

Bryce Staver - Powercast Harvester Team

Zacharias (Zack) Komodromos - Transceiver Team

Weekly Summary

Over the past week, we had another meeting with our client and continued testing on the SPI communication (MCU) and transceiver. In addition, we are working on programming the MCU. We also added more components to our Altium schematic. We are in the final phases of testing and intend to have a rough layout assembled soon.

Past week accomplishments

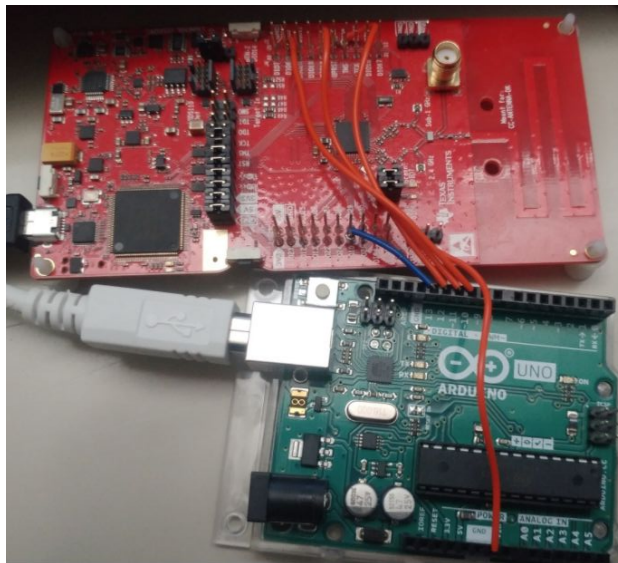
This being a weekly report vs a bi-weekly, everything has been adjusted to reflect this.

MCU Team (Jacob and Ted)

- Set up documentation describing setting up GitLab repository for CCS on other devices (Jacob)
- Attempted programming SPI on MCU (Jacob)
 - Moved to Arduino testing due to struggles seeing what the MCU was doing when it was “transmitting”
- Research on the SPI communication of MCU (Ted)

Transceiver Team (Zack and Douglas)

The below achievements were contributed to evenly by Zack and Douglas. Work was done together, at the same time, so contribution is approximately 50/50.

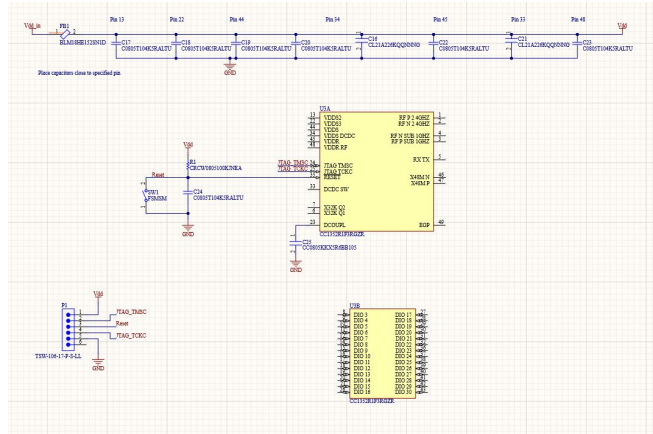


Current MCU test setup

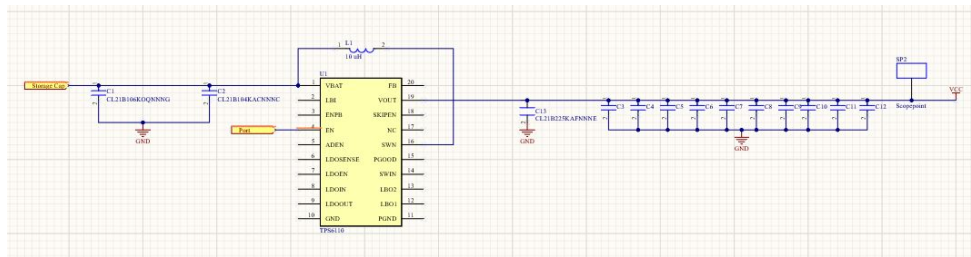
- Started testing the MCU SPI communication with an Arduino since there seems to be an issue with it
- Wrote code for the Arduino and the MCU for SPI communication
- Probed and tested to debug the code

Harvester Team (Bryce and Eddie)

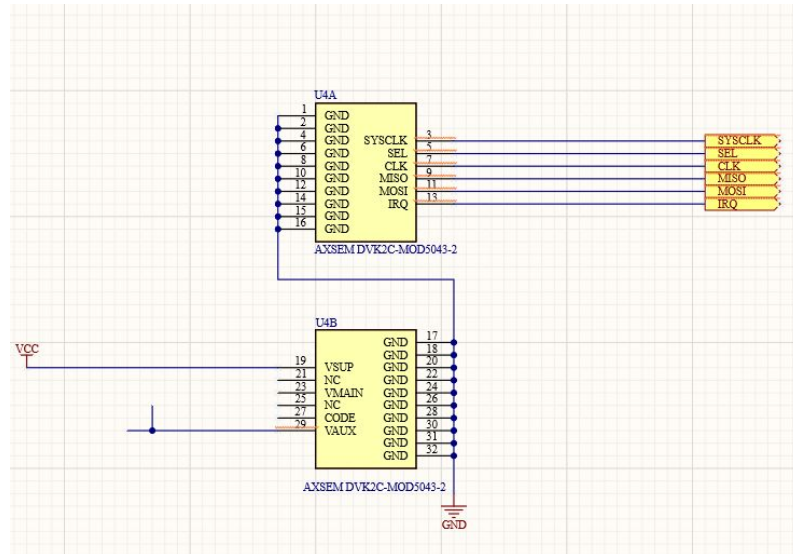
- Harvester testing is finished.



MCU schematic



Second Boost schematic



Transceiver schematic

Pending issues

- MCU team issue: Continue writing code to test MCU and transceiver interaction

Individual contributions

The below hours include a rough estimate of hours worked over the last week.

<u>NAME</u>	<u>Individual Contributions</u> (Quick list of contributions. This should be short.)	<u>Hours this week</u>	<u>HOURS cumulative</u>
Bryce Staver	Altium work, Test features, RF setup, Footprint wrap up	6	24
Douglas Zuercher	Basic transceiver setup on breadboard Schematic work in Altium Designer MCU SPI setup	10	31
Edmund Duan	Altium work, Test features, RF setup, Parts research	6	24
Jacob Bernardi	Began programming SPI communication on MCU	7	23
Zack Komodromos	Schematic and Altium work Help on interfacing MCU and transceiver	10	32
Kwanghum Park	Research and work on code with Code Composer Studio remotely	6	17

Plans for the upcoming week

MCU / Transceiver Testing (Jacob and Douglas and Zack)

- Continue writing code for transceiver programming
- Testing SPI communication of MCU individually and in addition to the transceiver

Altium Work (Ted, Eddie, and Bryce)

- Connections between MCU and transceiver.
- Connect the components together (awaiting MCU and transceiver team to decide connections) as this is in parallel with first perfboard revision.
- Hold a team-wide schematic review (awaiting same as above)
- Place and route components on layout view (work on layout of switching regulator and RF trace)
- Add headers for GPIO and other functions