EE / CPR E / SE 492

Wake-up Harvester Design for Batteryless IoT System

sdmay21-14 (3/1 – 3/15)

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 two weeks, we were able to get communication with the transceiver and make it programmable. In addition, we have the PCB layout more or less finished with the exception of the MCU connections. We are now planning to confirm that the transceiver can work as it should while also finishing up the PCB layout.

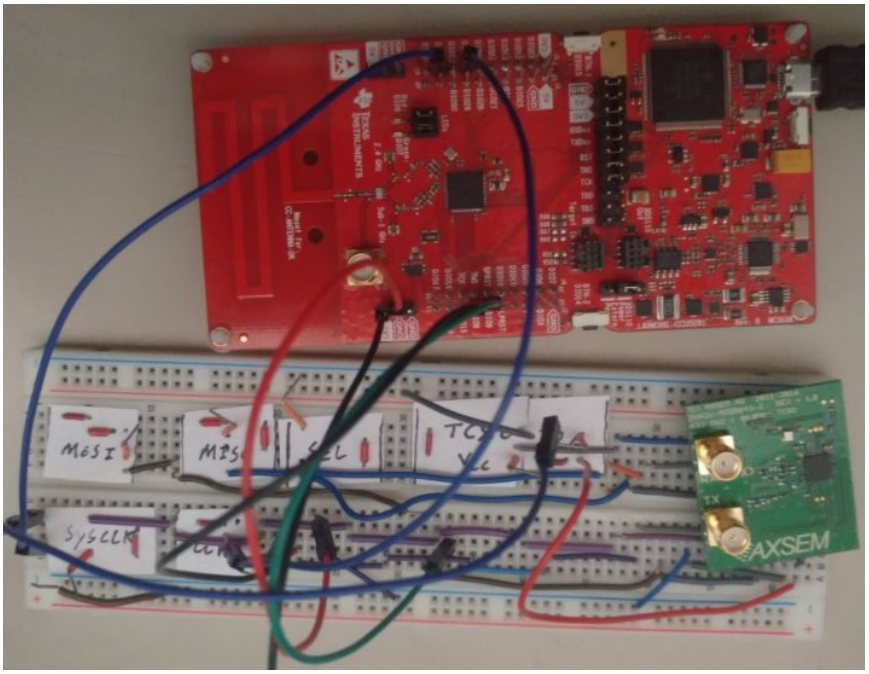
Past week accomplishments

MCU Team (Jacob and Ted)

- Researched programming MCU via JTAG connection for programming on board (Jacob)
- Assisted transceiver team with MCU SPI API programming and interfacing with transceiver (Jacob)
- Assisted Altium work team finishing the layout of Altium PCB (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 transceiver testing setup

SPI communication and additional clock signal viewed on oscilloscope

- We completed writing the SPI API for the MCU team, which will allow them to communicate data from the MCU to the transceiver.
- We confirmed that the transceiver is programmable and SPI functions correctly by writing values to test registers and reading those values back.
- We finished writing functions which set up the transceiver's RF signal. Also, we are now able to program the transceiver to either receive or transmit.
    - All functions are currently being tested.

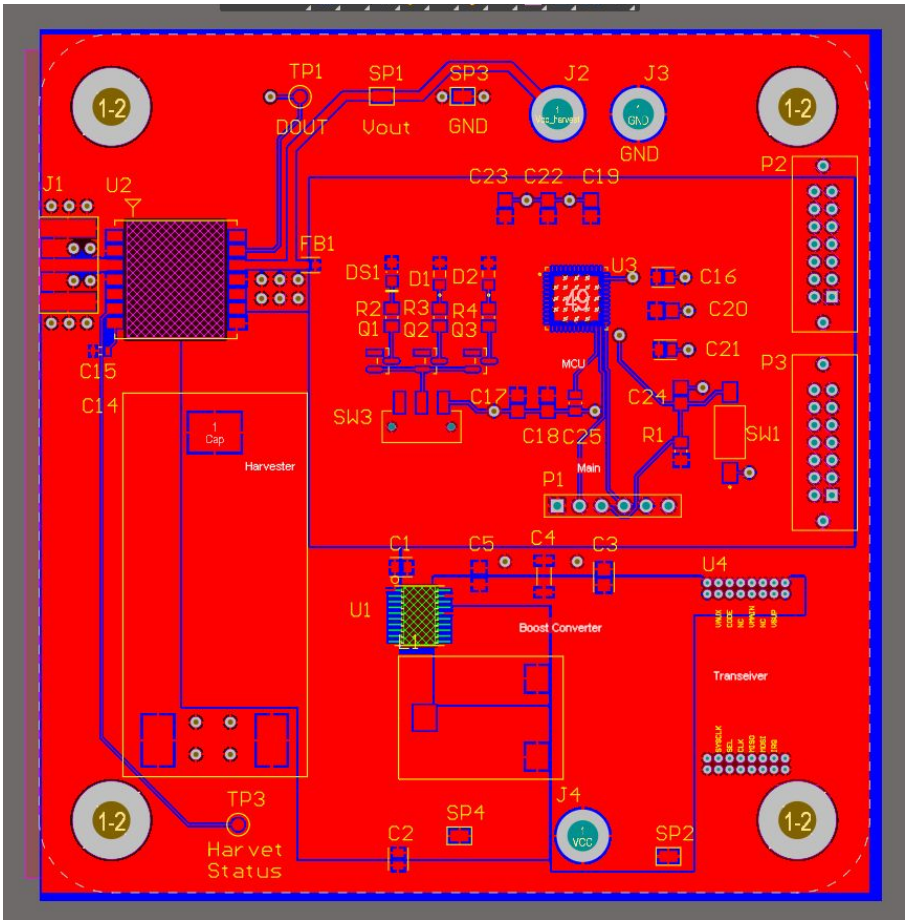
Harvester Team (Bryce and Eddie)

- Harvester testing is finished.

Altium Work (Bryce and Eddie)

Eddie and Bryce worked on adding testing features

- Layout finished minus MCU.



Current PCB layout

Pending issues

- To make testing the transceiver more streamlined, we requested a second MCU but there doesn't seem to be one on a debug board like the one we were already given.

Individual contributions

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

NAME	**Individual Contributions** (Quick list of contributions. This should be short.)	**Hours this week**	**HOURS cumulative**

Bryce Staver	Altium PCB layout	18	42
Douglas Zuercher	Worked on MCU SPI API Worked on transceiver programming Worked on a more detailed understanding of how reading/writing to “long” addresses works	15	46
Edmund Duan	Altium PCB layout	15	39
Jacob Bernardi	Helped interface MCU and transceiver Researched JTAG programming	15	38
Zack Komodromos	Help on MCU SPI API Help on transceiver programming SPI	15	47
Kwanghum Park	Altium PCB layout	15	32

Plans for the upcoming week

MCU / Transceiver Testing (Douglas, Zack and Jacob)

- Test the transceiver API we wrote up to program the transceiver
- Confirm TX and RX function
- Confirm WOR mode
- Confirm IRQ functionality

Altium Work (Ted, Eddie, and Bryce)

- Completing PCB connections between MCU and transceiver once finalized by respective teams.
- Look at adding transceiving components for MCU on Dr. Duwe’s request.