

sdmay22-39: Fast, Compact, High Strength Magnetic Pulse Generator

Weekly Report 5

Oct 25 - Nov 1

Team Members

Ben Newell

James Camp

Mohd Harith Arsyad

Abdulraheem Alquinas

Tom Zaborowski

Tyler Bolton

Weekly Summary

This week, the team decided it was time to make a design proposal for our collaborative circuit design. We were given two days to discuss our individual designs and make the best circuit out of all the individual designs. Most of the members of the team focused on coil design. A few of the other members focused on simulating the various designs in order to find the best circuit design for the magnetic field pulse. The goal of this design proposal was to to make a circuit that could achieve 500 Gauss within a rise time of 100ns. This task proved difficult to do and it took many hours to design a circuit that could achieve this.

Pending Issues

We need to discuss our design proposal with the client and get feedback for it. We also need to talk more about designing the coil and understanding the physical limitations of how much we can change each parameter of the coil. We also wanted to discuss the two coil configuration and possibly implementing that in our circuit.

Weekly Accomplishments

Ben Newell - Worked with the team to create an initial design proposal. Other responsibilities (multiple exams) led to less work being done this week.

James Camp - Read other's weekly reports to client to catch up. Understood how the circuit works. Experimented with the MOSFET used by the previous senior design group.

Mohd Harith Arsyad - I worked on finding ways to optimize the inductor value we choose for our circuit. I also helped draft the design proposal and read additional research papers to understand the generation of the magnetic field better.

Abdulraheem Alquinas - I researched how to design a coil, and researched MOSFETs' datasheet to analyze its specification to choose one for the design.

Tom Zaborowski - I helped to draft the design proposal. I worked with team members to make the first team design. I specifically worked on designing the coil.

Tyler Bolton - I did a few more simulations over the design and found a way to experiment with the capacitors. I also worked with team members to create the first design.

Plans for Next Week

Ben Newell - Import spice models into ADS and simulate the circuit from our initial design proposal.

James Camp - Import major circuit components into ADS (using SPICE files), and test the circuit design in ADS.

Mohd Harith Arsyad - I plan on testing different configurations of the circuit such as the two coil system because it seems very hard to get our rise time under 100ns with the current design.

Abdulraheem Alquinas - Discuss the design proposal with the advisor and the client to modify or proceed with the design. Continue researching to obtain a better coil and MOSFET if the design was discussed to be modified.

Tom Zaborowski - I plan to discuss with the team and advisors about the design proposal. If there are no problems with the design, we plan to move on to do more testing. If the design proposal is flawed, the team plans to go back to the drawing board and design again.

Tyler Bolton - I plan to talk to the client about the design proposal, and if there are not any problems, move on to circuit testing. If there are problems, I plan to go back to simulating the circuit and find ways to improve the design and solve the problems.

Individual Contributions

Name	Individual Contribution	Hours
Ben Newell	Group meetings, Design Proposal	3
James Camp	Circuit simulation, reading other's weekly report	3
Mohd Harith Arsyad	Research, simulation, and design proposal	15
Abdulraheem Alquinas	Circuit design and simulation	7
Tom Zaborowski	Coil designing, design proposal	9
Tyler Bolton	Simulation, Circuit Design	7