sdmay20-39: High Speed Magnetic Field Generator

Week 2 Report
October 7 - October 19

Team Members

Jason Cheng — *Technology Lead*
Craig Philipp — *Communication Lead*
Zach Higgs — *Project Lead*
Harel Cohen — *Hardware Lead*
Ben Colson — *Test Engineer*

Summary of Progress this Report

For these weeks, we focused on testing the existing circuit and drawing up plans for dropping our rise time as much as we could. In doing this, we experimented with changing the experimental input conditions, including the function generated input and the voltages of the input. By doing this, we were able to see a change in the rise time, but also an increase in the ringing noise generated. This means that we have to keep in mind the tradeoffs of getting closer to our desired outcomes, but increasing noise and having to find someway to keep our signal integrity.

Pending Issues

We have 2 big issues. 1) We need to communicate with the project stakeholders to figure out what our inputs will be, since we noted that the rise time dropped significantly as the input voltage increased. 2) We need to find or design a way to keep our signal integrity high and eliminate as much of the ringing noise generated by the circuit.

Plans for Upcoming Reporting Period

We will seek some feedback from our stakeholders, and continue to work around the issues we are seeing. In addition, we are going to work through some problems with signal integrity by creating some points to mount some large capacitors in an attempt to clean up our signals.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Jason Cheng	Continue working through some issues with our website, planning and submissions. In addition, I am starting to design the schematic and PCB to better stick to standardization of parts and figure out exactly how we can create points to mount to and better test.	18	0
Craig Philipp	In the past two weeks I have spent some time looking into different MOSFETS with lower input capacitance. I know that we had	20	0

	discussed increasing the voltage of the circuit and we proved that it did work but with this increase in voltage we would need a higher rated MOSFET. Even with this increase we should still be able to lower the input capacitance and try a few circuits with these varied MOSFETs. I have scheduled a meeting with Lee to do a safety training for the lab on Wednesday, though I am not sure it is the best idea to even use the lab. The only thing in there that we would want to use is the PCB milling machine and even Lee is telling us the thing is garbage, so I don't know if we want to use it. In the past two weeks I would say I have spent maybe 10 hours each week so 20 total. Most of this time has been research and communication with people.		
Zach Higgs	I have worked on the simulations of our circuit and the physical testing of our circuit. After simulating our circuit with various inductors, voltages, and MOSFETs. After simulating I worked on testing Wei Shen's circuit and changing the source voltage to see if it matched our simulations. Over all I have worked about 6 hours each week.	12	
Harel Cohen	Tested and modified some voltage dependant variable. Worked through voltage restrictions that were put in place, that seem to work better when removed. The circuit can handle the increase, but I experimented if there was an easy way to go about changing the inputs.	11	0
Ben Colson	Coordinate testing and figure out how we are going to eventually test and attach extra components. Figure out how we can change around various circuits without changing our test setup.	5	

Gitlab Activity Summary

Nothing to report.