

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

Weekly Report 1

Sept 27 - Oct 3

### **Team Members**

Ben Newell

James Camp

Mohd Harith Arsyad

Abdulraheem Alquinas

Tom Zaborowski

Tyler Bolton

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### **Weekly Summary**

In the weekly Monday meeting, we discussed our plans moving forward after researching more about this project. We drafted a design problem statement and a requirements summary and got feedback for it. We also drafted a project timeline to make sure we are on course to meeting the final requirements of this project for the first semester. After getting feedback and discussing the iterations of this project over the years, we planned on having everyone in the team simulate designs for the magnetic pulse generator in ADS and Multisim to get a better understanding of the circuit and the importance of each component.

### **Pending Issues**

When doing the building the circuit for simulations in Multisim, we couldn't find some of the components used by the previous groups such as the diodes and MOSFETs. This could be because we need to import the specific components previous groups used.

### **Weekly Accomplishments**

**Ben Newell** - Created design problem statement and laid down the main requirements for the project as set by the client and the team. Went through the previous group's design documents.

**James Camp** - Created the previous senior design project's design in ADS.

**Mohd Harith Arsyad** - Went through one more of the research paper and tried building out the different circuit designs from past groups (2017, 2020) in Multisim.

**Abdulraheem Alquinas** - Read two of the research papers to get a better understanding of the topic and used Multisim to test and analyze the design circuit of the previous group (2020).

**Tom Zaborowski** - Simulated the circuit designs from the 2016-2017, 2019-2020, and 2020-2021 groups via Multisim. Learning how to import components from other databases/

**Tyler Bolton** - Read through the documents from the previous groups, created a timeline and design process, and simulated the circuit design from the previous groups in Multisim.

### Plans for Next Week

**Ben Newell** - Simulate some previous designs using ADS. Gain more understanding of the circuit and what we are trying to accomplish through reading the previous team's documents and relevant research papers.

**James Camp** - Redesign ADS schematics with parasitics and transmission lines for high frequency use and create "blocks" for impedance matching circuits. Read the research papers for GaN MOSFETS.

**Mohd Harith Arsyad** - Read more of the research papers and try to simulate the high speed field generation circuit given in one of the papers (10.1063/1.3679391)

**Abdulraheem Alquinas** - Continue reading the research papers, and searching for better MOSFETs or alternatives to use in the design to achieve the requirements

**Tom Zaborowski** - Continue reading more research papers on fast switching magnetic pulses, playing around with the previous group circuits, and looking for more ways to innovate on the previous group circuits.

**Tyler Bolton** - Read more of the research papers and continue simulating the circuit. Find ways to improve the circuit.

### Individual Contributions

Name	Individual Contribution	Hours
Ben Newell	Document work and Research	5
James Camp	Simulation and Document Work	3

Mohd Harith Arsyad	Document, research, and Multisim	5
Abdulraheem Alquinas	Document, research, and simulation	5
Tom Zaborowski	Research and simulations	5
Tyler Bolton	Document, research, and simulation	5