ECEN 405 Power electronics project 2021

Worth: 25%

The objective is to design and build a class D amplifier to power a sub-woofer speaker to the following specifications:

- 80 Watts into 4 Ω
- 10Hz to 200Hz bandwidth
- Input sensitivity of 1V for maximum output
- Maximum costs: $50 per person
- Groups of three
- Only the power amplifier section is to be designed, a DC supply will be provided for testing.

What do YOU need to do?

- Read the provided material (on Wiki)
- Research D Class amplifiers further to get more information you need
- Document any important information you come across
- Design the circuit
- PCB layout and construction
- Testing and document the results
- Prepare report
- Submit

The report will need to be written describing:

- Detailed design of the circuit and why particular design elements were chosen
- Justification for the components used
- Performance measurements
- Physical design

The assessment will be based on:

- Report (15%)
  - Quality of report (grammar, layout, introduction, conclusion, plots, referencing)
  - The design process (topology, hardware selection)
  - The performance of the amplifier (efficiency, bandwidth, distortion)
  - Approximately 5 to 10 pages
- PCB layout and construction (5%)
- Demonstration (5%)

Timeline:

- Week 1: Create team
- Week 6: Submit PCB to techies
- TBC: Demonstration
- Assessment period: Report submission