

**University of Alaska Fairbanks
Electrical and Computer Engineering Department
EE 608 – Power Electronics Design
Spring 2013**

Power Electronics Design Project

Objective:

The objective of this project is to design, simulate using PSPICE, build, and test a power electronic conversion device capable of being fed from a single-phase 120VAC source or a 12VDC battery that meets the design requirements listed below. The design project will make use of the knowledge and skills acquired in previous course work and incorporate “

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Design Standards:

- 1) Follow IEEE Std 519 at point of common coupling for AC supplies:
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Report Format:

The specific written format requirements with section labels for the proposal, three major project reports (midterm, draft & final), and four bi-weekly progress reports will be provided in separate documents. The proposal and three major project reports should be sufficient in length to cover the required sections. The reports should give background on the specific application and explain how it applies to power electronics. You will also need to address a contemporary issue with the device that you are designing and building. Your report should also include any pertinent tables, figures, PSPICE inputs and outputs and CAD schematics for the purpose of demonstrating the application. Please provide a list of numbered references (including websites) in the order referenced in the reports and use the numbers in square brackets to annotate the referenced material in the report. Figures and tables need to have captions. Captions for figures are below the figure, while captions for tables are above the table. Also, please number the pages beginning with the second page. If you have an excessive amount of design and simulation results, you should include it in an Appendix with page numbers and refer to it in the main document.

Presentations:

You are required to give three presentations on this design project. Each presentation will be followed by a 5-minute question and answer period. You will meet with the instructor to discuss the proposal and midterm presentations.

- 1) ***Proposal (Lab Time: Monday, Feb. 6, 2012):*** *You are required* to give a 10-minute project proposal presentation which lays out your intended design based on the given requirements and a workplan with specific tasks outlined. Include preliminary PSPICE schematics, timeline, initial parts list and budget.
- 2) ***Midterm Progress (Lab Time: Monday, March 19, 2012):*** *You are required* to give a 15-minute midterm progress report presentation which presents your progress up to the time of the presentation. Include PSPICE and CAD schematics and documented design results.
- 3) ***Final Report (Final Exam Time: Wednesday, May 9, 2012):*** *You are required* to give a 20-minute final project presentation explaining your design based on the given requirements and making final conclusions. Include PSPICE and CADENCE schematics and data/plots that support the final design requirements. The final presentations will occur during the scheduled midterms.

