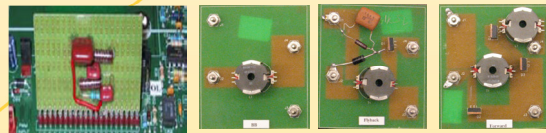


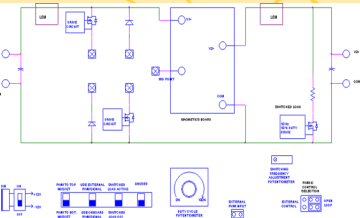
Power Electronics Laboratory

Switching Power Pole Board



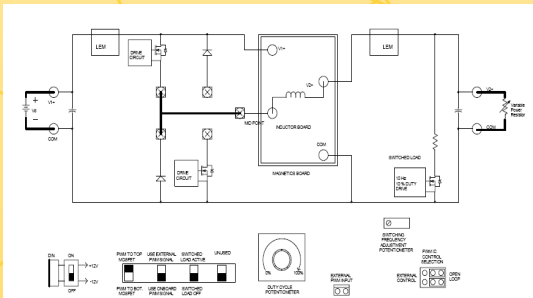
Controller Board BB Board Flyback Forward

- Extends the switching power-pole concept
- Configurable to perform variety of experiments
- Input and output current sensors
- Overvoltage and overcurrent protection
- Both analog and digital control possible

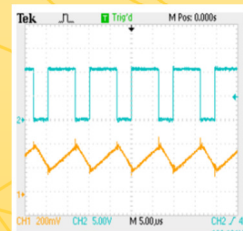


Board Schematic

Buck Converter

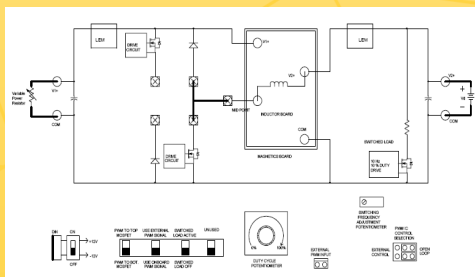


Circuit Diagram

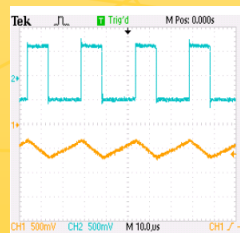


PWM pulses and Inductor Current

Boost Converter

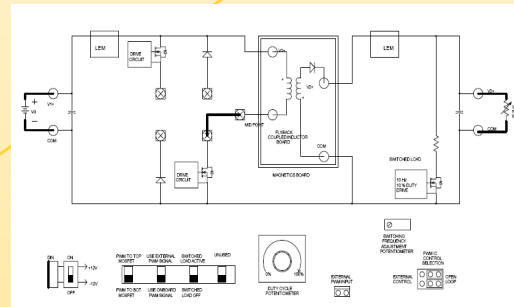


Circuit Diagram

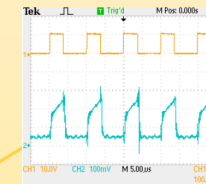


PWM pulses and Input Current

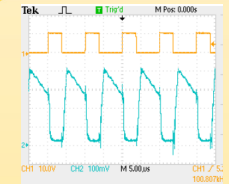
Flyback Converter



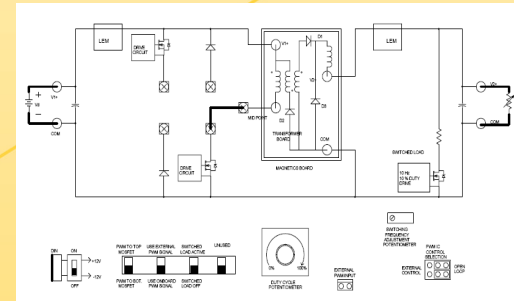
Circuit Diagram



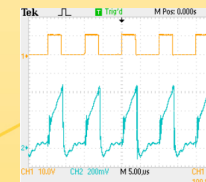
Primary and Secondary Winding Currents



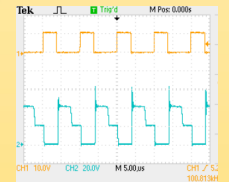
Forward Converter



Circuit Diagram

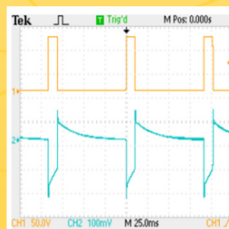


Input Current and Primary Switch Voltage



Voltage-Mode Control

- Transfer function $\left(\frac{\tilde{v}_o(s)}{\tilde{d}(s)}\right)$ calculated using a perturbation at duty ratio and measuring output voltage perturbation in PSpice
- Controller is designed and implemented using an R-C circuit



w/o feedback control



w/ feedback control

Output voltage response for a step change in load

Budget

Power Pole Board: \$1145.00

Vendor Information

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Manual, Schematic & other info:

<http://www.ece.umn.edu/groups/power>



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