Homework 2, due February 9, 2011

1. Derive the relationship between input and output voltages (V_{in}, V_{out}) and switch open and closed times (T_O, T_C) for the inverting and step-up switching regulators.

2. For a inverting switching regulator carefully plot the voltage at the output, and at the junction which connects the switch, the diode, and the inductor for continuous mode operation where $V_{in} = 5\,\text{V}$ and $V_{out} = -10\,\text{V}$.

3. Repeat the previous question for discontinuous mode operation.

4. For a step-up switching regualator carefully plot the voltage at the output, and at the junction which connects the switch, the diode, and the inductor for continuous mode operation where $V_{in} = 5\,\text{V}$ and $V_{out} = 20\,\text{V}$.

5. Repeat the previous question for discontinuous mode operation.