HW#5 – ECE 5/472 Power Electronics

Boise State University, due Monday, September 13, 2010

1. Problem 2-14 from the book.
2. Problem 2-17 from the book.
3. Read the data sheet seen at: http://www.jaycar.com.au/images_uploaded/relaydrv.pdf
    a. In Fig. A does the current in the inductor grow unbounded if Vin is held at +12 V indefinetly so that Q1 stays on? Why or why not? It's okay to assume Q1 is ideal.
    b. Sketch an equivalent circuit for Fig. A using a MOSFET. Do we need the resistor in series with Vin in this equivalent circuit? Why or why not?
    c. Suppose the IRF1503S (http://www.cmosedu.com/jbaker/courses/ece5472/f10/irf1503s.pdf) is used to drive the relay described in the data sheet. Do we still need a diode across the inductor? Why or why not? Simulate the operation of the new design using LTspice.
    d. Is the IRF1503S a good choice for this design? (hint: transistors that can handle larger voltages or currents are more expensive than "weaker" transistors.)