

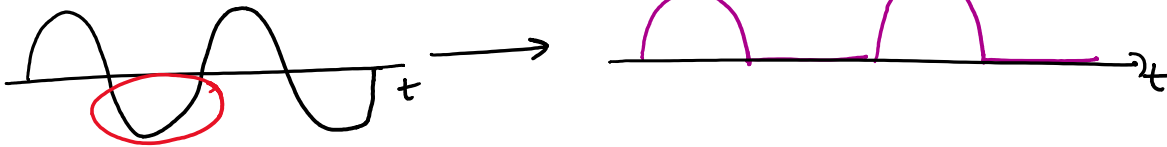
ECT 310 - Lecture 11

Monday, February 5, 2018 10:32 AM

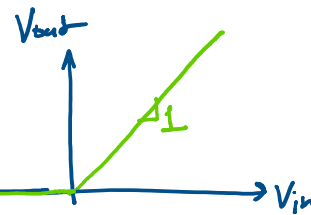
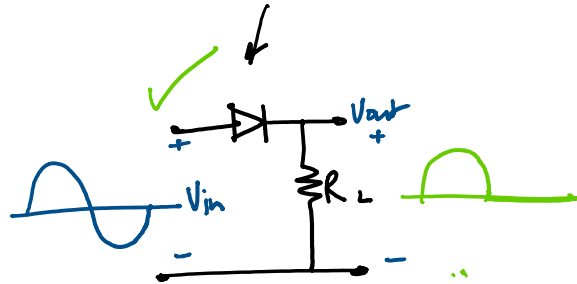
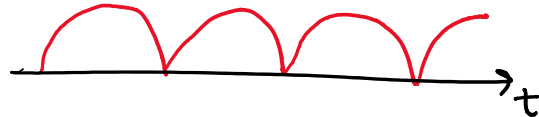
AC

DC

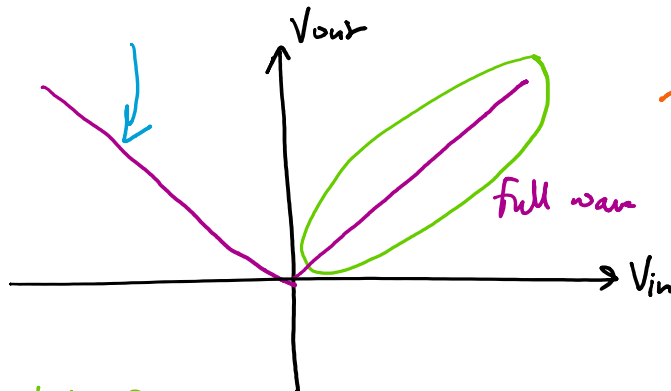
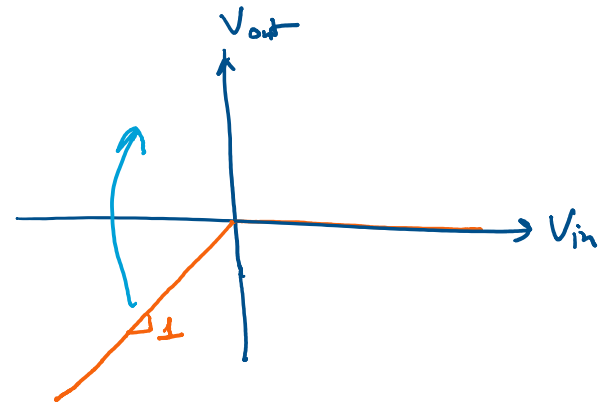
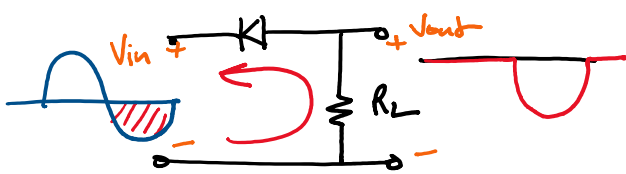
half-wave rectifier



full-wave rectifier



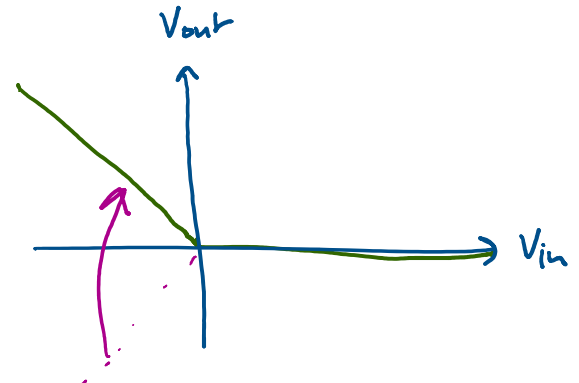
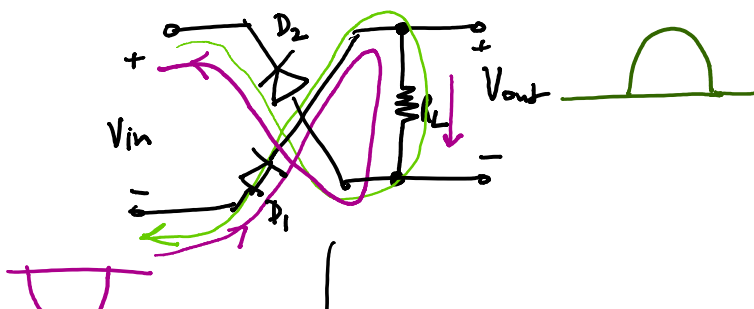
combine

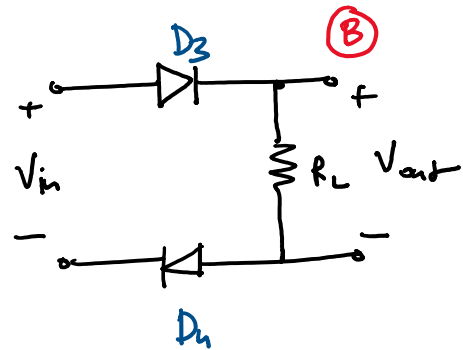
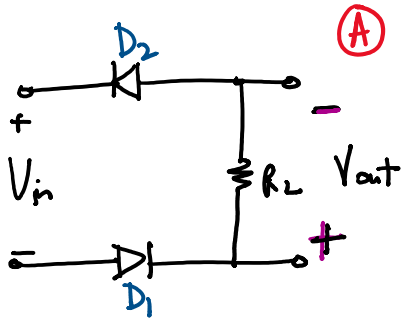
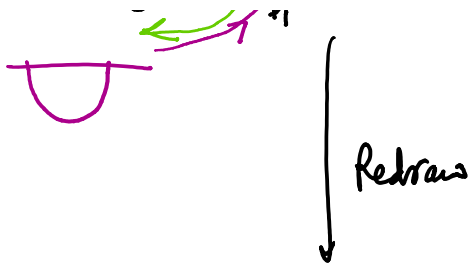


full wave rectifier input-output characteristics

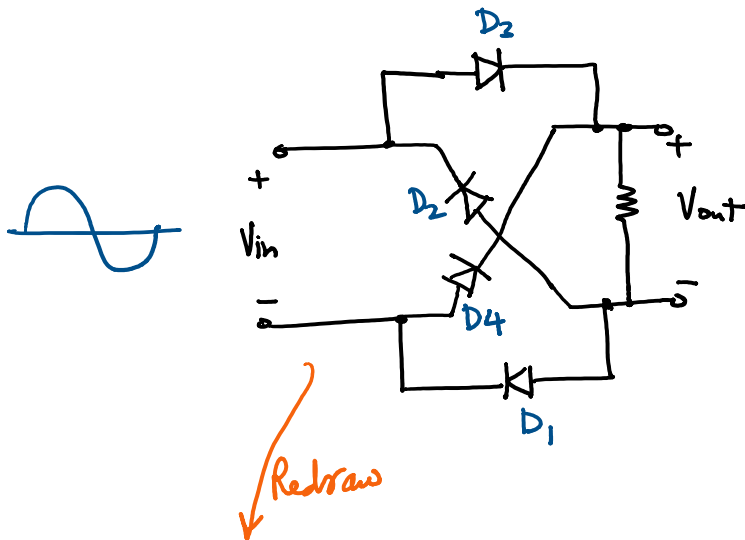
$V_{in} > 0 \Rightarrow$ both D_1 & D_2 are off

$V_{in} < 0 \Rightarrow$

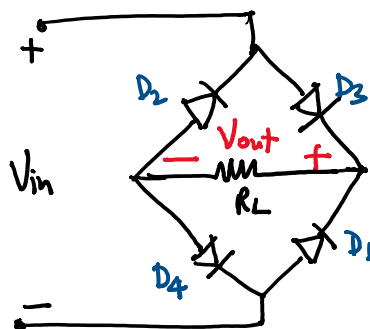




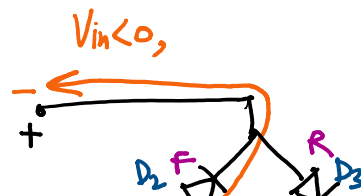
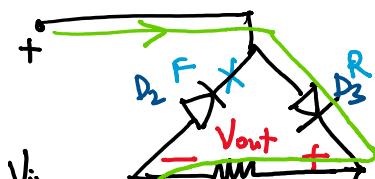
Combine (A) + (B)

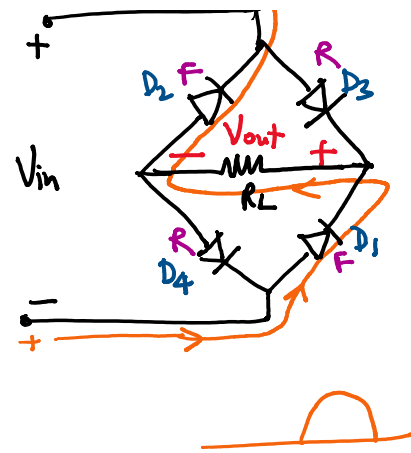
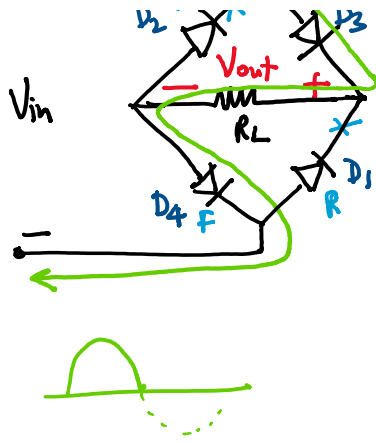


Bridge (full-wave) Rectifier

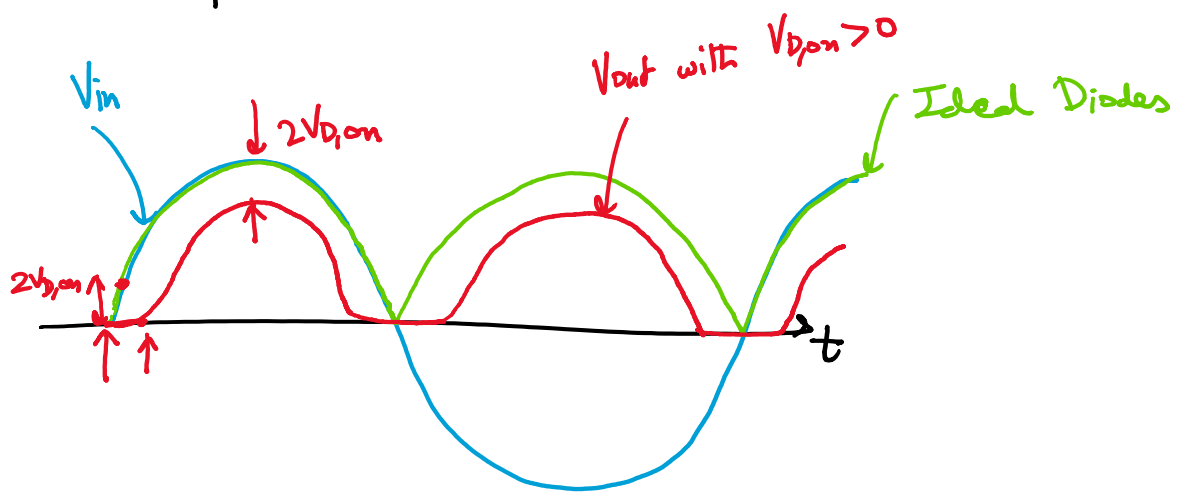
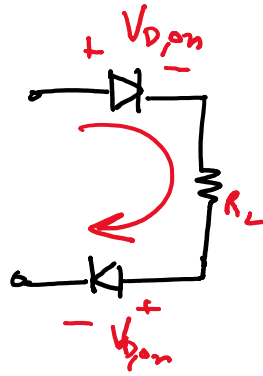
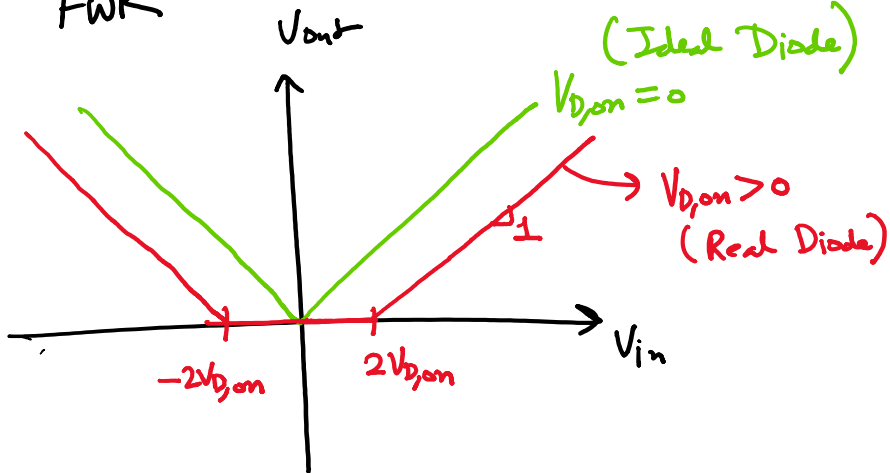


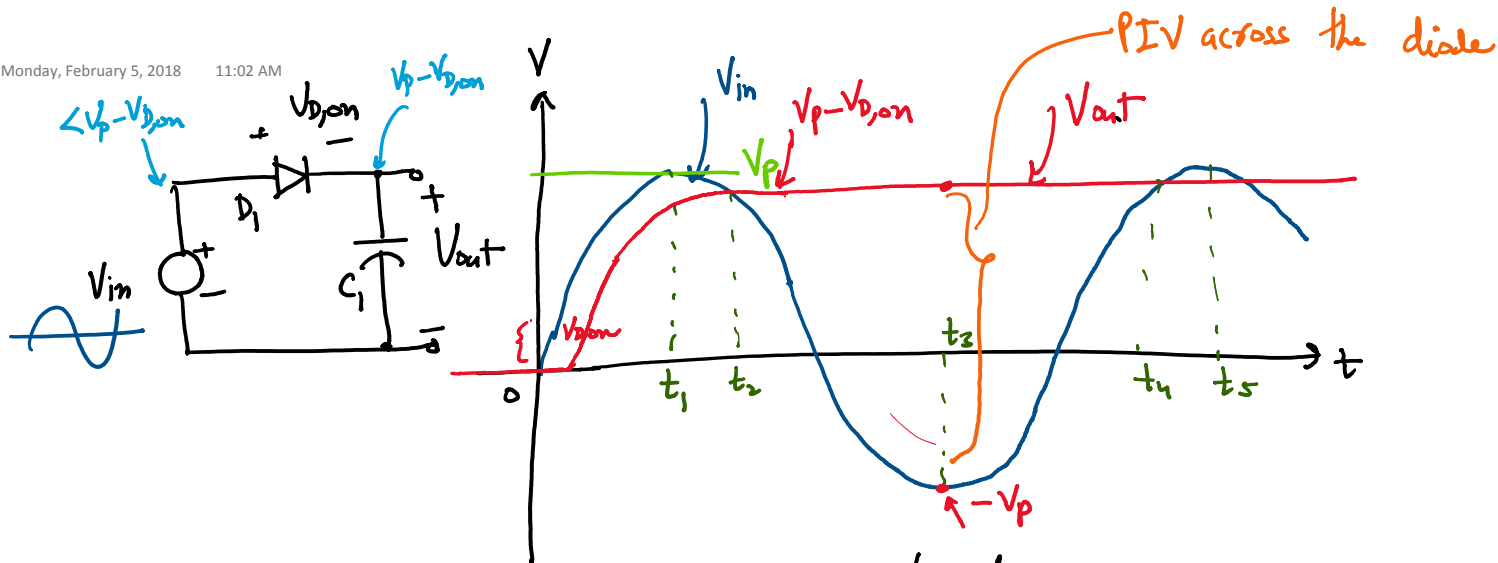
$V_{in} > 0$, Assume Ideal Diodes ($V_{D,on} = 0$)





FWR





from $t \Rightarrow 0$ to $t_1 \Rightarrow D_1$ is ON, Cap is charged

@ $t = t_2 \Rightarrow D_1$ is turned off

@ $t = t_2 \Rightarrow$

$$V_{in} = -V_p$$

$$V_{out} = V_p - V_{D,on}$$

Diode sees a reverse bias voltage of $2V_p - V_{D,on} \approx 2V_p$

Peak Inverse Voltage (PIV) across diode $\approx 2V_p$

Q. What if we have a load?

