ECE 5/4472 Power Electronics

BOISE STATE UNIVERSITY

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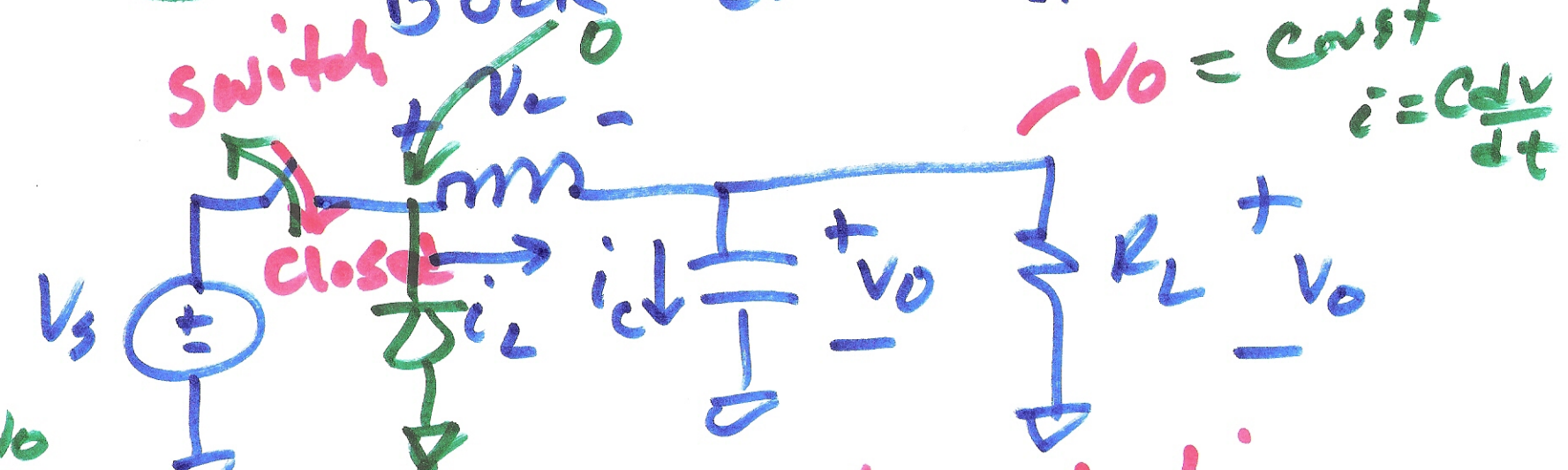
Lecture 9

$0 - V_0 = L \frac{di_L}{dT}$

$i_L(t) = \frac{-V_0}{L} \cdot t$

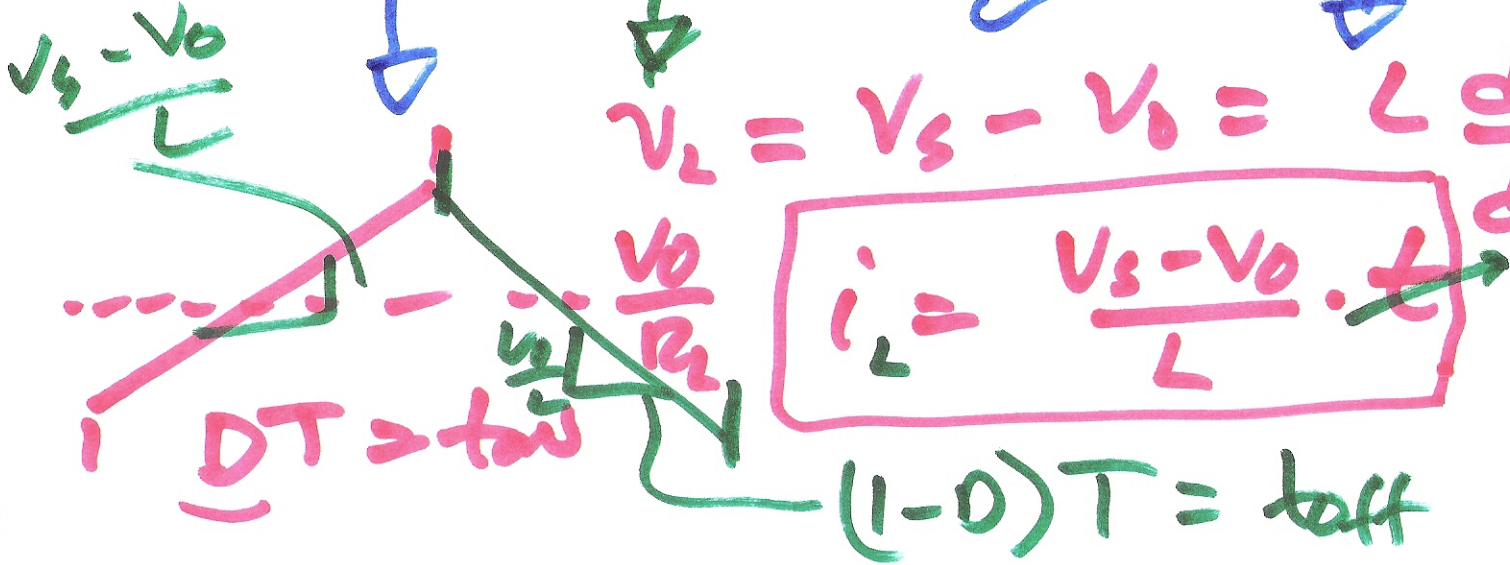
$D \cdot V_s = V_0$

Buck converter



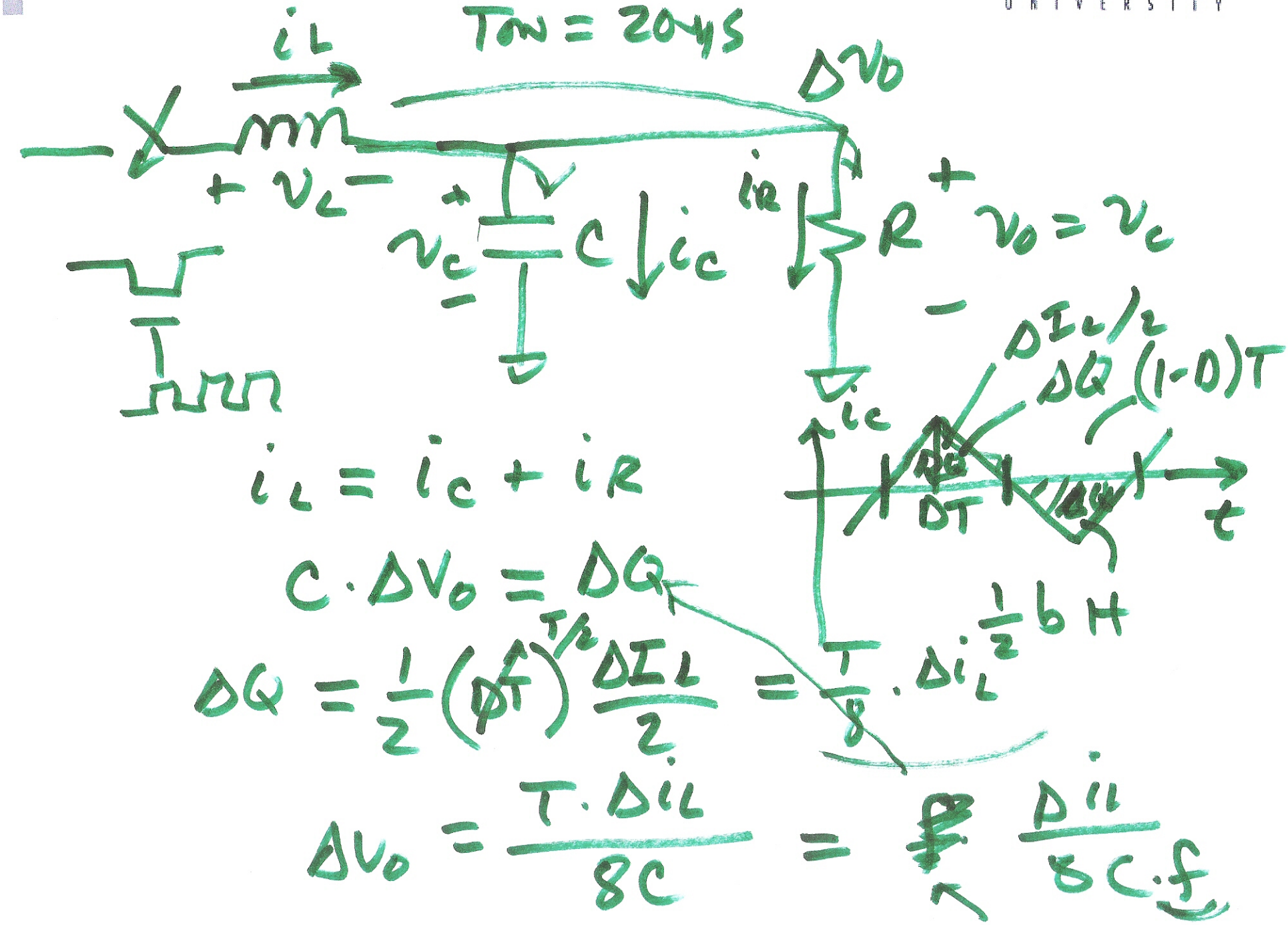
$v_L = V_s - V_0 = L \frac{di_L}{dt}$

$i_L = \frac{V_s - V_0}{L} \cdot t$



$T = 50\mu s$, $D = 0.4$ $CV = Q$

$T_{ON} = 20\mu s$



$$i_L = i_c + i_R$$

$$C \cdot \Delta V_o = \Delta Q$$

$$\Delta Q = \frac{1}{2}(DT)\frac{T}{2}\frac{\Delta I_L}{2} = \frac{T}{8}\cdot\Delta i_L$$

$\frac{1}{2}$ b H

$$\Delta V_o = \frac{T \cdot \Delta i_L}{8C} = \frac{D}{8C \cdot f}\,\Delta i_L$$

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