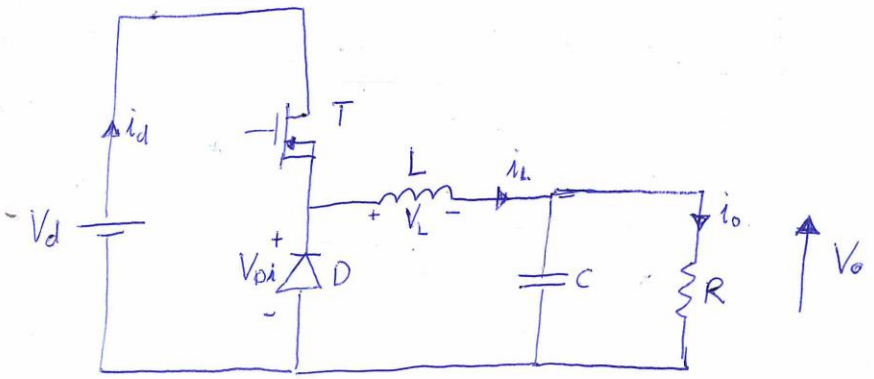
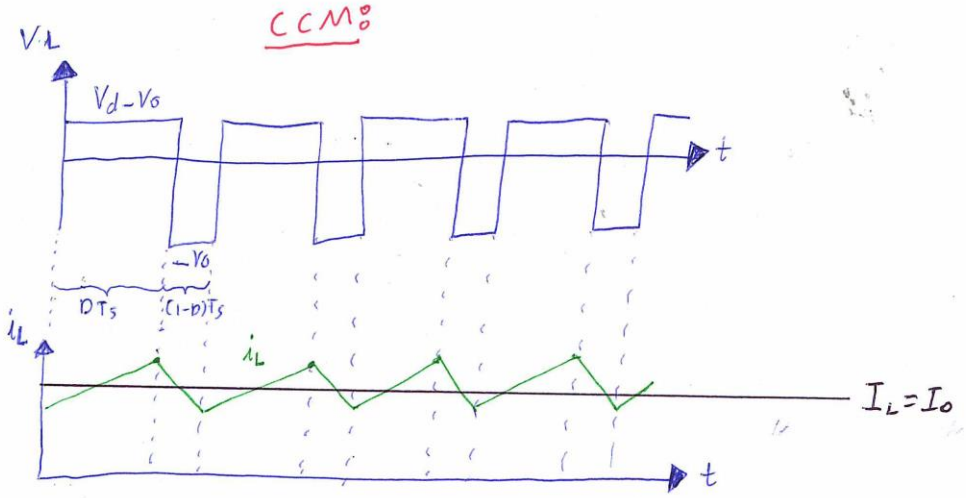
Contents

Buck



CCM:



Duty Cycle Derivation $\left(\frac{V_o}{V_d} = D\right)$:

$$\frac{(V_d - V_o)DT_s}{L} = \frac{V_o(1-D)T_s}{L} \quad \text{(equal areas)}$$

$$V_d DT_s - V_o DT_s = V_o T_s - V_o DT_s$$

$$V_d DT_s = V_o(T_s - DT_s + DT_s)$$

$$V_d DT_s = V_o T_s$$

$$\boxed{\frac{V_o}{V_d} = D = \frac{I_d}{I_o}}$$

as $P_d = P_o$ (lossless converter)