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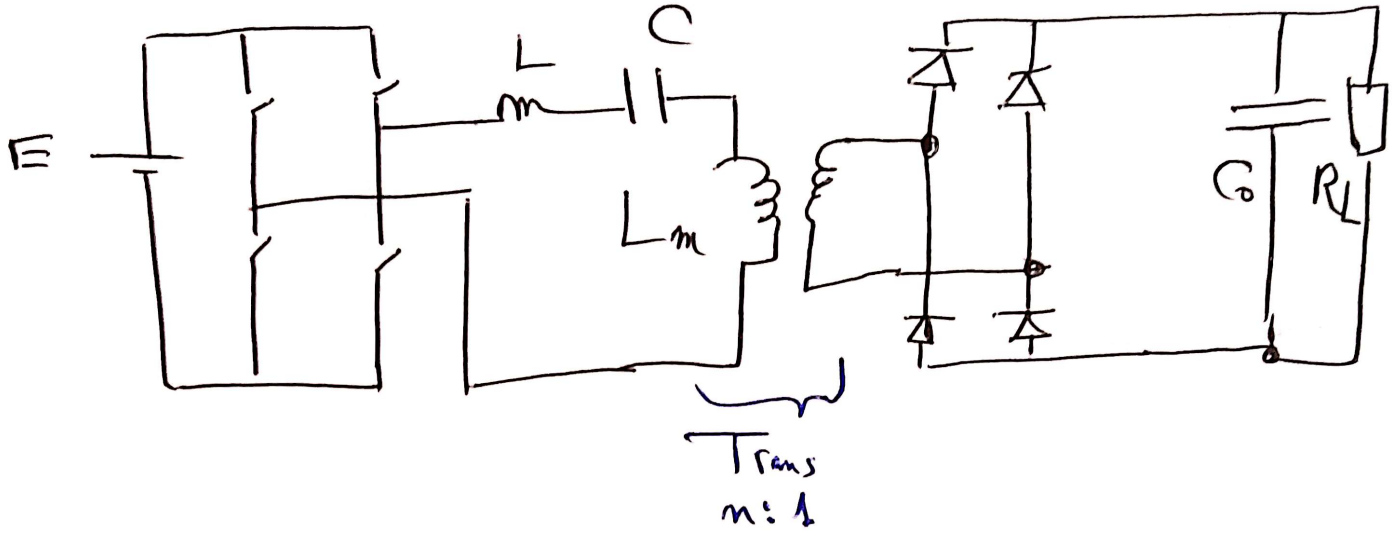

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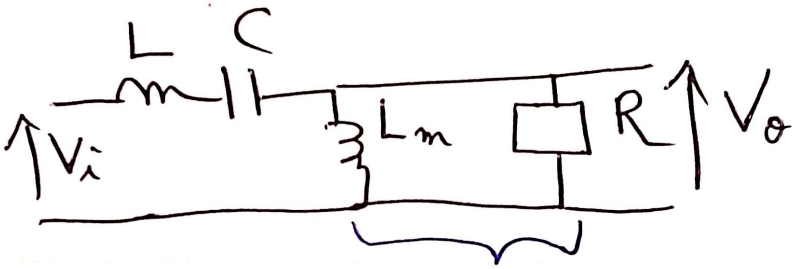

$$Z_{//} = R \,//\, Z_{Lm}$$

$$V_o = V_i \frac{Z_{//}}{Z_L + Z_C + Z_{//}} \; ; \; G = \frac{V_o}{V_i} \Rightarrow G = \frac{1}{\frac{Z_L}{Z_{//}} + \frac{Z_C}{Z_{//}} + 1}$$

$$\Rightarrow G = \frac{1/Z_C}{\frac{1}{Z_C} + \frac{1}{Z_{//}}\left(1 + \frac{Z_L}{Z_C}\right)} = \frac{jCw}{jCw + \left(\frac{1}{R} + \frac{1}{jL_m w}\right)(1 + jLw\,jCw)}$$

$$G = \frac{jCw\; jL_m w}{jCw\,jL_m w + \left(\frac{jL_m w}{R} + 1\right)(1 + jL_m w\,jCw)}$$

2)

$$G = \frac{-\frac{L_m}{L} LC\omega^2}{\left(1 - LC\omega^2 - \frac{L_m}{L} LC\omega^2\right) + j\frac{L_m\omega}{R}\left(1 - LC\omega^2\right)}$$

$$L_n := \frac{L_m}{L}; \quad \omega_0 = \frac{1}{\sqrt{LC}} \quad i\rho_n = \frac{\omega}{\omega_0}$$

$$\Rightarrow \frac{L_m}{L} LC\,\omega^2 = L_n\left(\frac{\omega}{\omega_0}\right)^2 = L_n \rho_n^2$$

and $$L_m \frac{\omega}{R} = \frac{L_m}{L} \sqrt{L}\sqrt{L} \frac{\omega}{R} = L_n \sqrt{\frac{L}{C}} \frac{1}{R} \omega\sqrt{LC}$$

$$= L_n \frac{\omega}{\omega_0} \frac{\sqrt{L/C}}{R}$$

$$= L_n \rho_n \varphi_e \quad \text{where} \quad \varphi_e =: \frac{\sqrt{L/C}}{R}$$

So:

$$G = \frac{L_n \rho_n^2}{\left(\rho_n^2 + L_n \rho_n^2 - 1\right) + j L_n \varphi_e \rho_n \left(-1 + \rho_n^2\right)}$$

$$G = \frac{L_n \rho_n^2}{\left[\rho_n^2(1 + L_n) - 1\right] + j L_n \varphi_e \rho_n \left[\rho_n^2 - 1\right]}$$