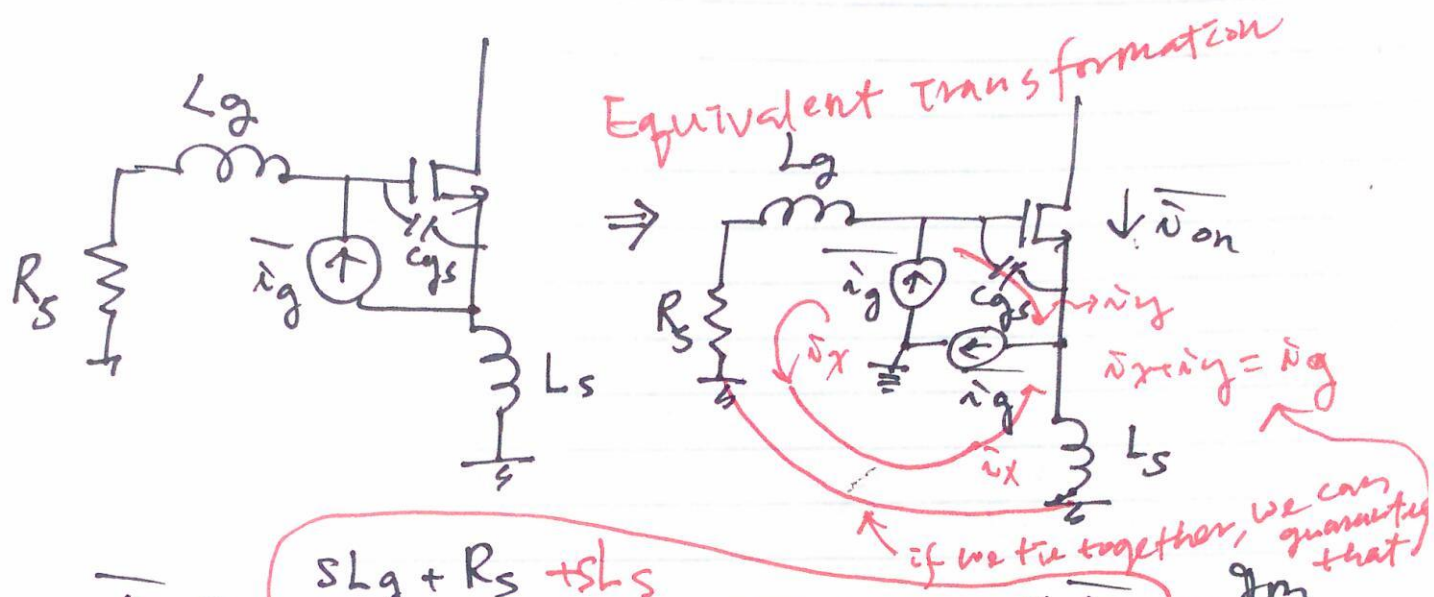


Separation of gate wise current

(1)



$$\bar{i}_{on} = \frac{sL_g + R_s + sL_s}{sL_g + R_s + \frac{1}{sC_{gs}} + sL_s + \frac{g_m L_s}{C_{gs}}} \times \bar{i}_g \times \frac{g_m}{sC_{gs}}$$

$$= \frac{sL_g + R_s + sL_s}{2R_s} \times \bar{i}_g \times \frac{\omega_T}{s\omega}$$

$$= \frac{1}{2R_s} \frac{\omega_T}{s\omega} \left(R_s + \frac{s}{\omega C_{gs}} \right) \bar{i}_g$$

$\therefore s(L_g + L_s) = \frac{1}{sC_{gs}}$
 \rightarrow at resonance.

$$= \frac{1}{2} \frac{\omega_T}{s\omega} \left(1 + jQ \right) \bar{i}_g$$