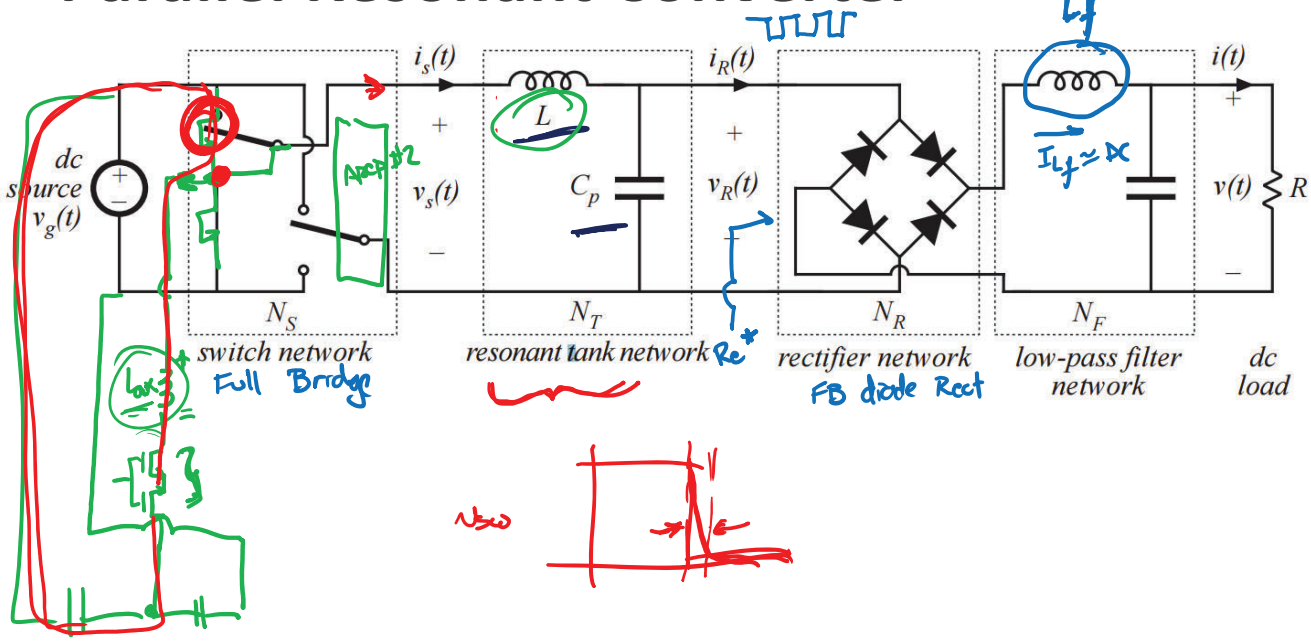
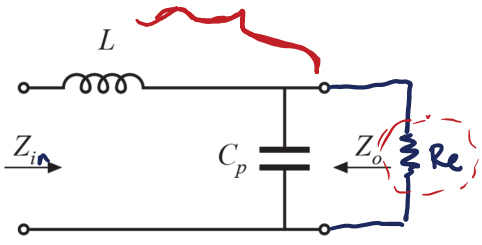
Parallel Resonant Converter



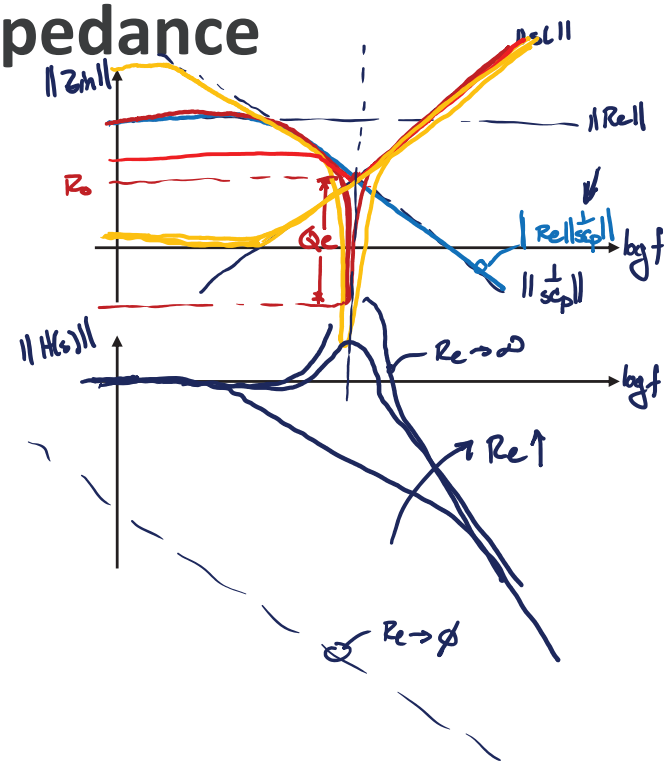
PRC Tank Input Impedance



$$Z_{in} = sL + \frac{1}{sC_p} \| R_e$$

$$H(s) = \frac{\frac{1}{sC_p} \| R_e}{Z_{in}}$$

$$Q_e = \frac{R_e}{R_0}$$



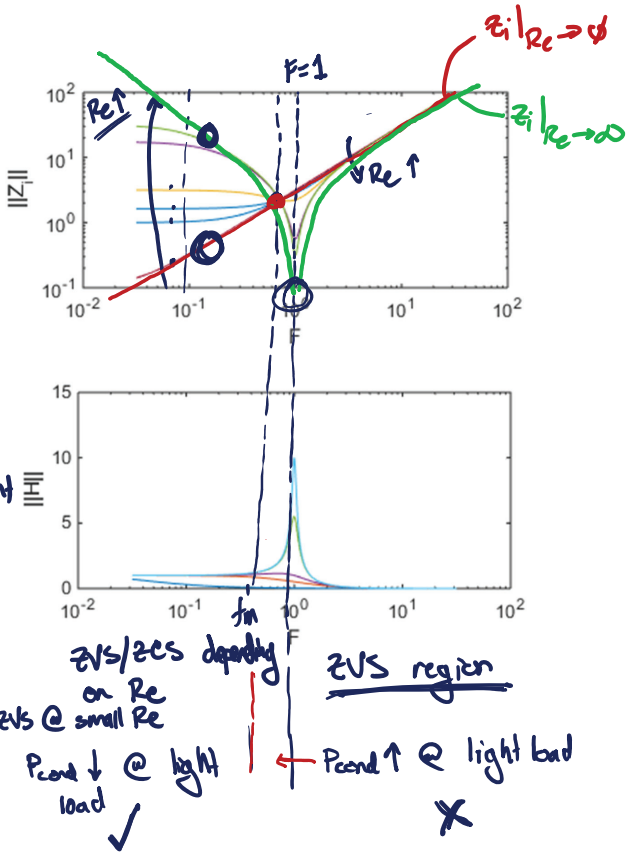
PRC Tank

Textbook Theorem 1
section 19.4.2 in 2nd edition
section 22.4 in 3rd edition

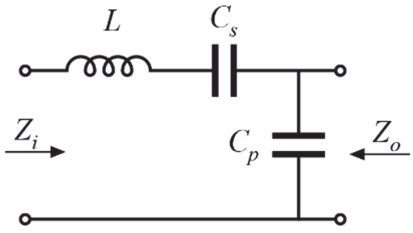
If tank is purely reactive, $\|Z_i(j\omega_x)\|$ is a purely monotonic function of Re

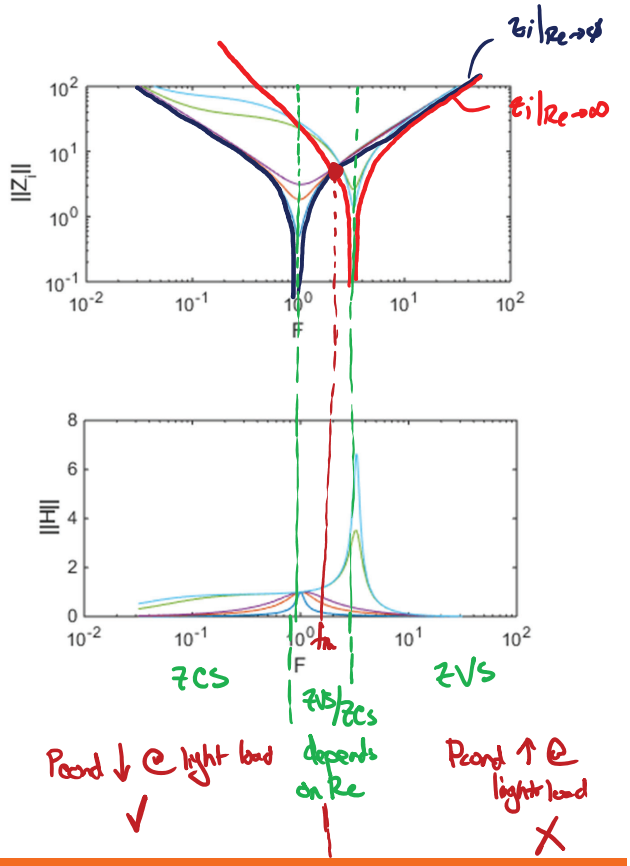
Can really just look at $Z_i|_{Re\to 0}$ & $Z_i|_{Re\to\infty}$, all other curves of different Re are monotonic in between.

Q F=1, no problem w/ short circuit, but open circuit results in very high current stress.

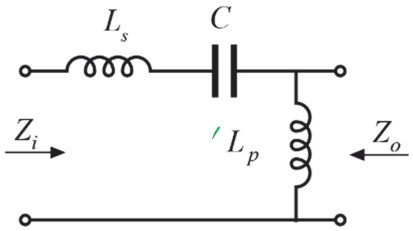


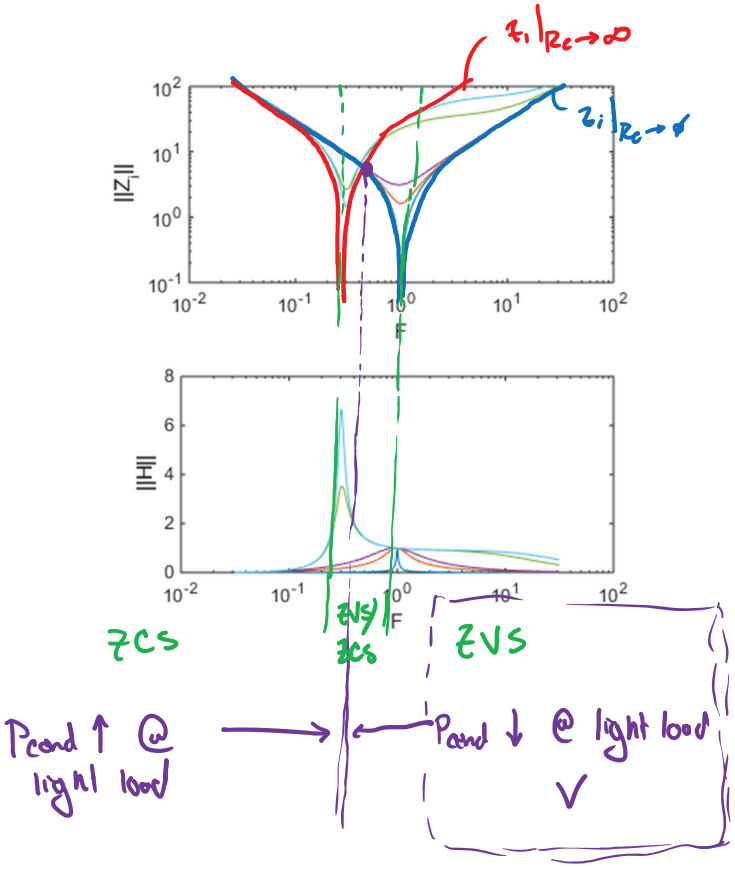
LCC



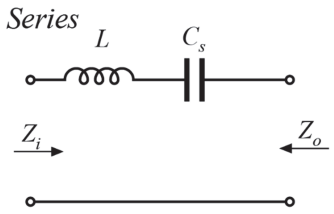


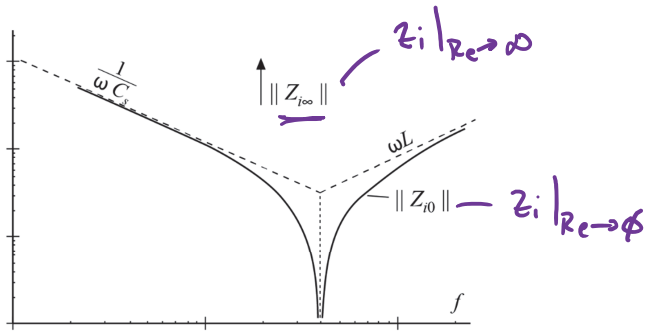
LLC

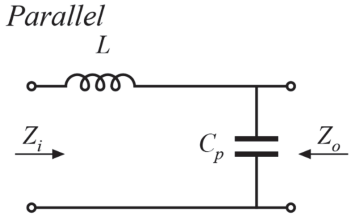


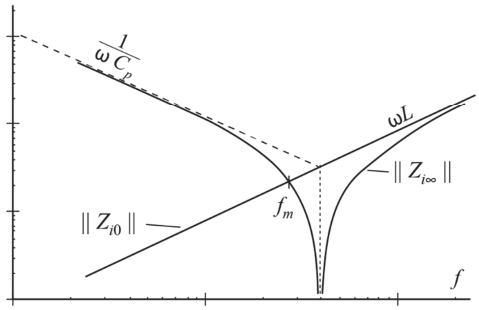


Tank Summary (1/2)

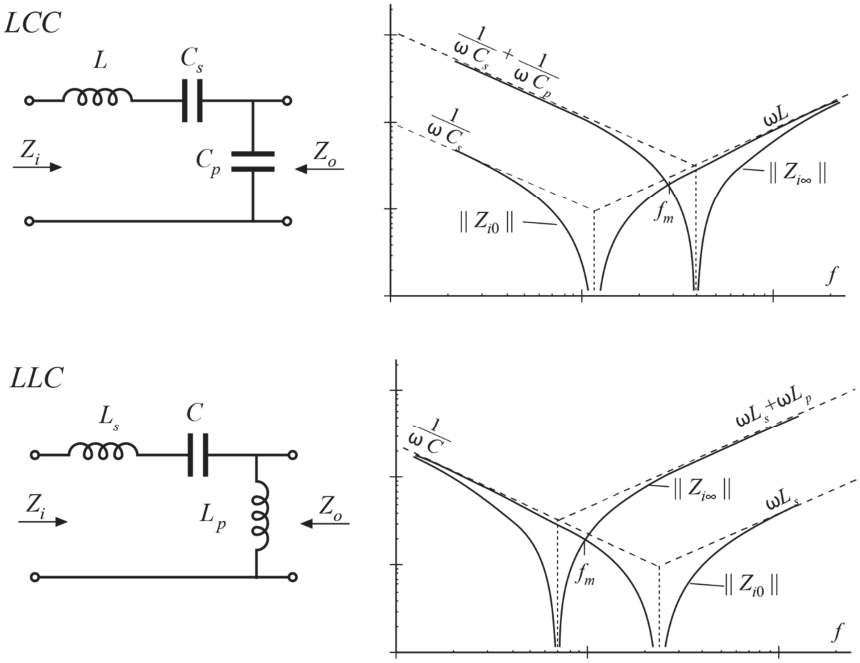




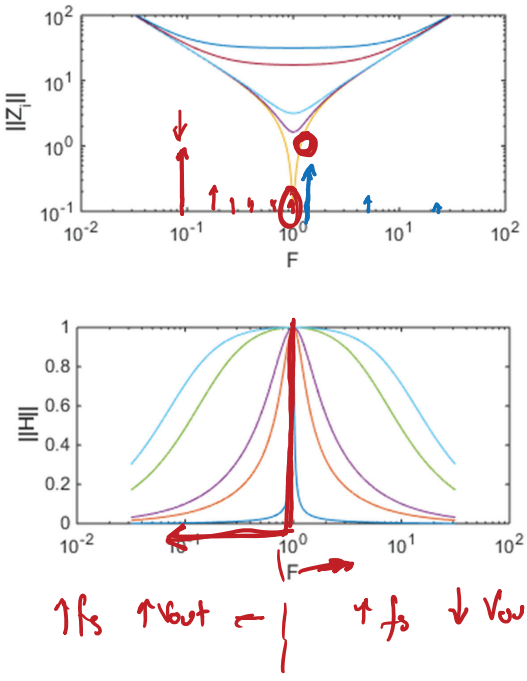




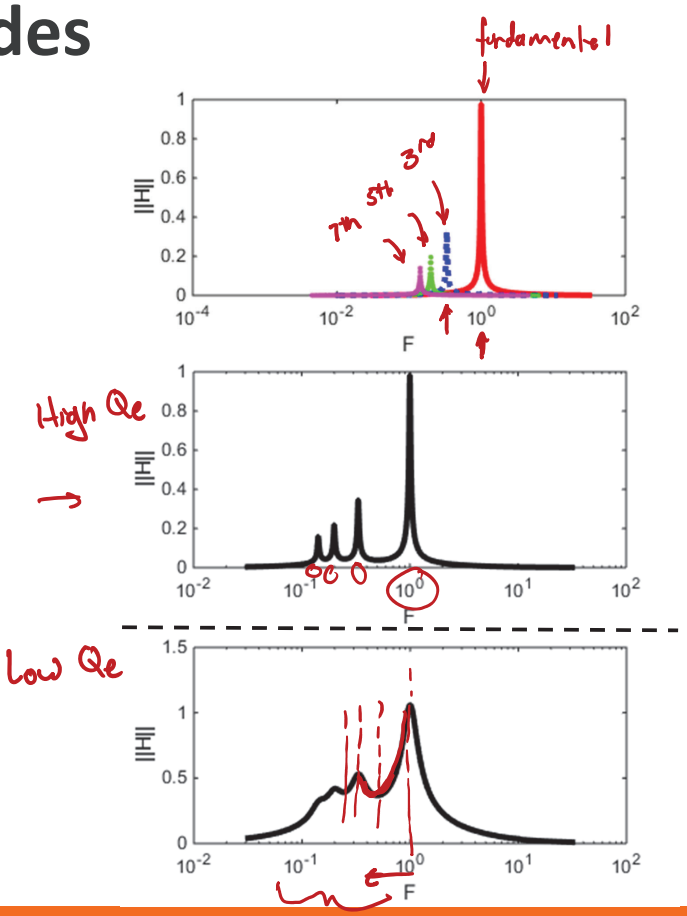
Tank Summary (2/2)



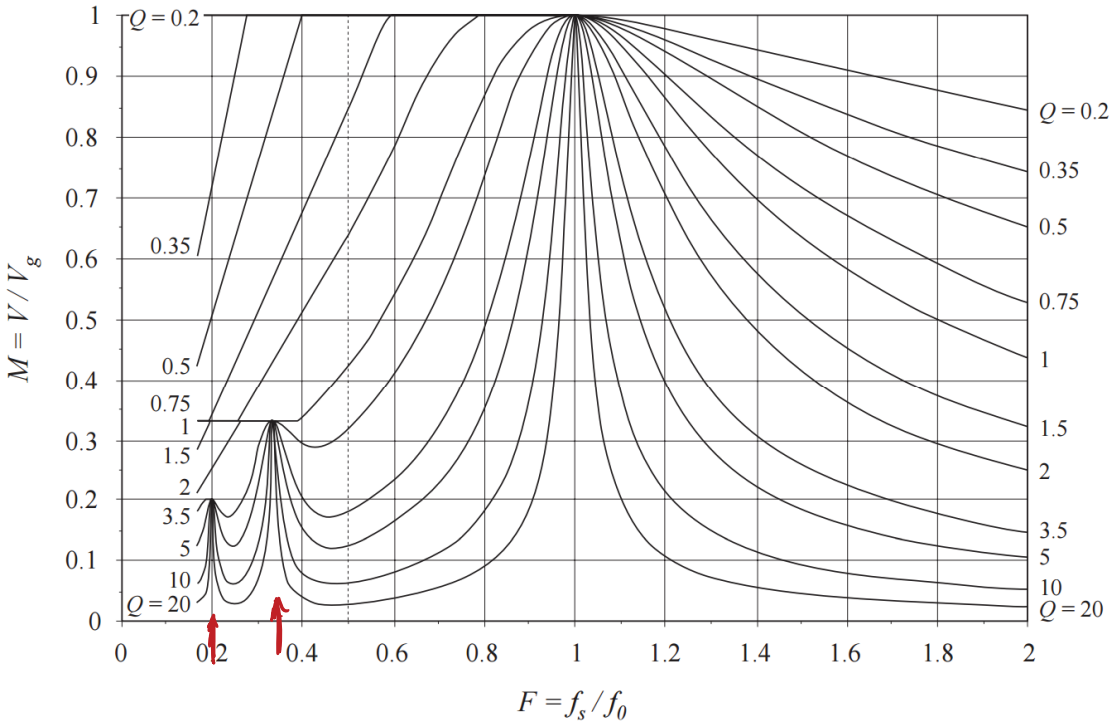
Series Resonant Tank – Subharmonic Modes



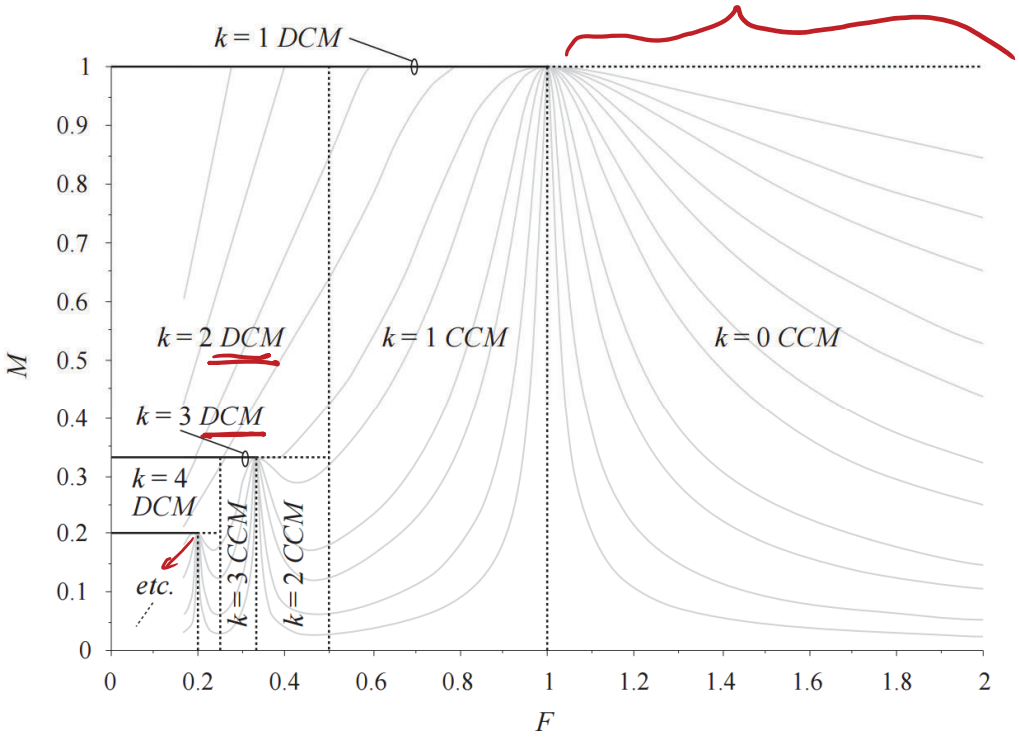
Subharmonic Modes



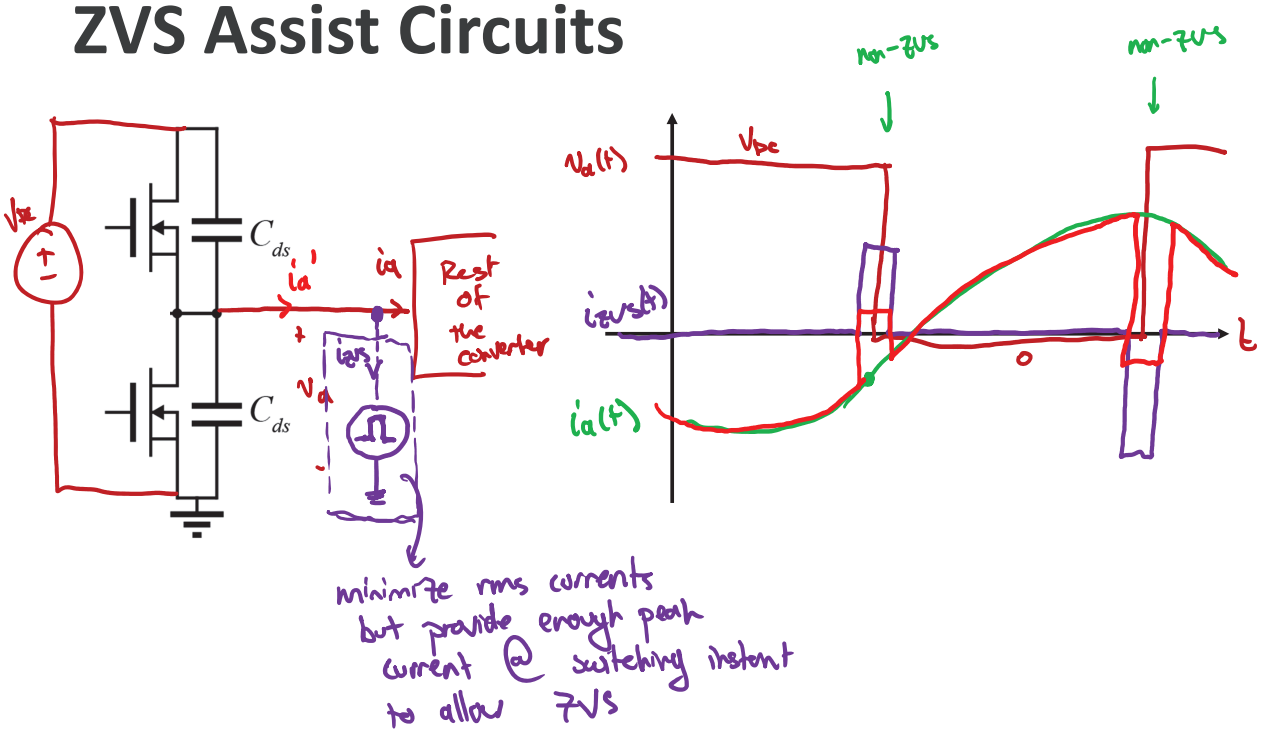
SRC Control Plane



SRC Mode Boundaries



ZVS Assist Circuits



ZVS Tank Examples