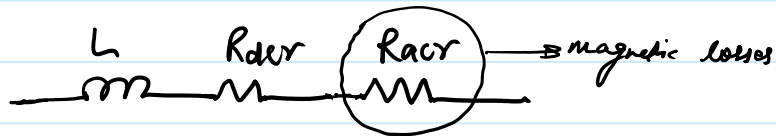
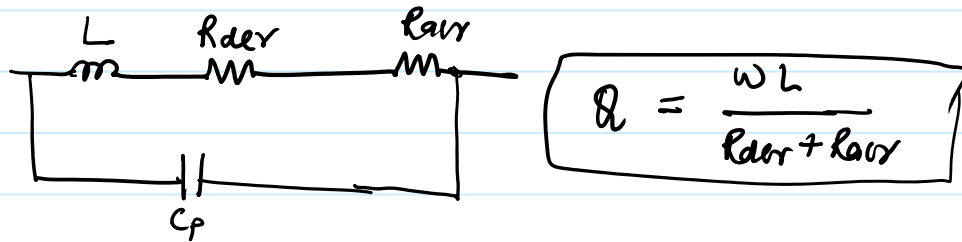


Magnetic Losses



R_{dcr} → winding resistance

R_{acr} → freq. dependent (core loss + skin effect loss)



C_p → interwinding capacitance

L & C_p cause resonance → referred as inductor self resonance

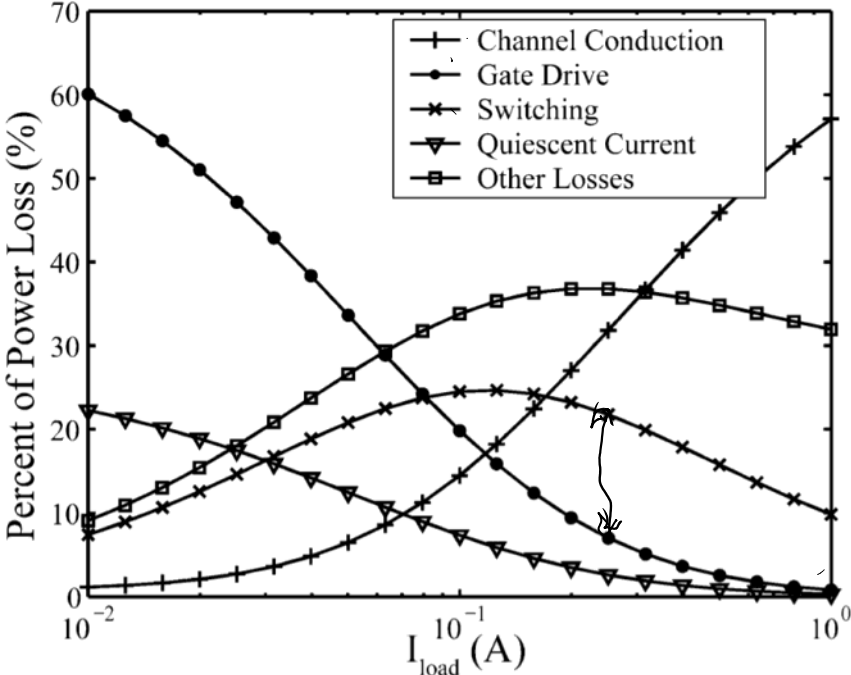
$$f_{self.res} = \frac{1}{2\pi\sqrt{LC_p}}$$

$$P_{acr} = I_{rms}^2 \cdot R_{acr} \Rightarrow R_{acr} = \frac{P_{acr}}{I_{rms}^2}$$

↑
measured

↓
only ripple

Losses vs. Load Current



Ref: M. D. Mulligan, et al "A constant-frequency method for improving light-load efficiency in synchronous buck converters,"IEEE Power Electron. Lett., vol. 3, no. 1, pp. 24–29, Mar. 2005.

