

AC Summary

Resistors: $V_{R,\max} = I_{\max} R$

In phase with I

Capacitors: $V_{C,\max} = I_{\max} X_C$ $X_C = 1/(2\pi f C)$

Lags I

Inductors: $V_{L,\max} = I_{\max} X_L$ $X_L = 2\pi f L$

Leads I

Generator: $V_{\text{gen},\max} = I_{\max} Z$ $Z = \sqrt{R^2 + (X_L - X_C)^2}$

Can lead or lag I

$$\tan(\phi) = (X_L - X_C)/R$$

Power is only dissipated in resistor:

$$\overline{P} = \frac{1}{2} I_{\max} V_{\text{gen},\max} \cos(\phi)$$