

Series/Parallel Resonance Comparison

NCEES® FE Reference Handbook Page 361



STUDY FOR FE

Quantity	Series Resonance	Parallel Resonance
Impedance	$Z = \sqrt{R^2 + (X_L - X_C)^2}$	$Z = \frac{1}{\sqrt{\frac{1}{R^2} + \left(\frac{1}{X_C} - \frac{1}{X_L}\right)^2}}$
Power factor angle	$\phi = \tan^{-1} \frac{X_L - X_C}{R}$	$\phi = \tan^{-1} R \left(\frac{1}{X_C} - \frac{1}{X_L} \right)$
Resonant Frequency	$\omega_o = 1/\sqrt{LC}$	$\omega_o = 1/\sqrt{LC}$
@ Resonant	Current is maximum	Impedance is maximum