

Lab 7 AC Circuits

1 Target

Design an AC circuit and compare the analytical response with the actual response.

2 Equipment

Same as previous Lab.

3 Procedure

The objective of this exercise is to compare values derived from theory and measurement, relating to the steady-state response of RLC circuits to sinusoidal inputs. Given the structure as shown, design a circuit so that each impedance block contains a capacitor or inductor and at least one resistor. Determine the voltage V as a phasor for several different input signals $V_s(t) = 5\cos(\omega t)$ where ω is varied over a wide range (e.g. from 100 to 100K). Measure V in your circuit (both amplitude and phase) relative to $V_s(t)$ for each ω and compare with the theoretical values.

Change the position of the energy storing components in your circuit and repeat the above. Plot your results as relative magnitude and phase vs $f = \omega/2\pi$.

