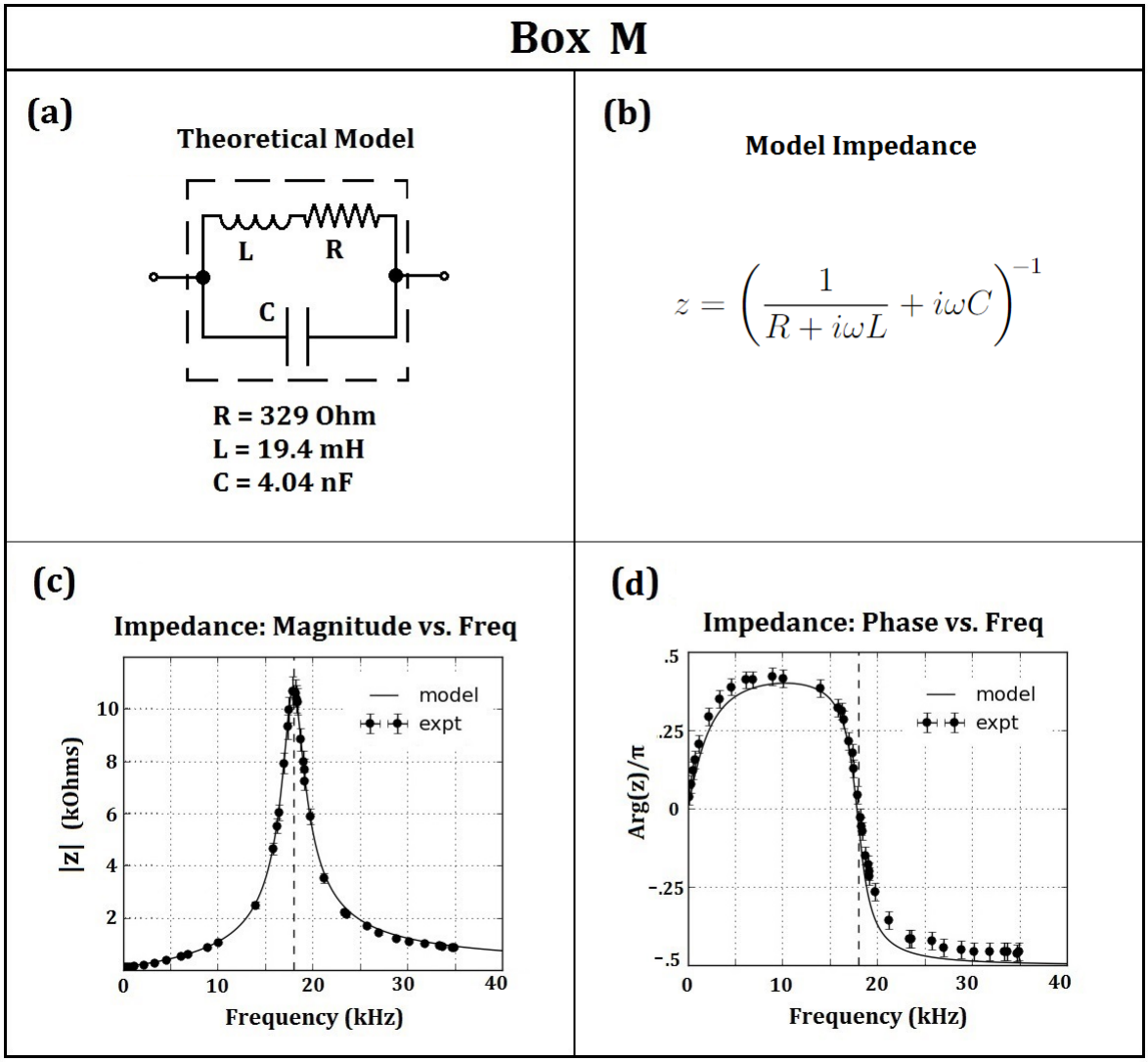

Figure 1: Impedance versus frequency for Box M. A model for the unknown circuit is shown in panel (a). The theoretical impedance associated with the model is given by the equation in panel (b). Panels (c,d) show the magnitude and phase of $z(f)$ for the experimental data (circles) and theoretical model (solid). Experimental data were obtained using the test circuit depicted in Figure 2. Error bars on the experimental data represent estimated uncertainties $\sigma_{|z|} = 5\%$, $\sigma_\phi = 5^o$, $\sigma_f = 100$Hz. Note that some error bars are small enough to be obscured by the symbols. Vertical dashed lines represent the model's nominal resonant frequency $f_0 = 17.986$kHz. The theoretical impedance of the model fits the data with reduced fit parameters $\chi^2_{|z|} = 9.34$ and $\chi^2_\phi = 3.36$. It can also be shown that the fit is disrupted by parameter changes on the order of 5%. We conclude that this model approximates the unknown circuit in Box M to an overall accuracy of about 10% in the 0-40kHz range, with a better fit near resonance and a poor fit near DC. A frequency-dependent model would be necessary to obtain a better fit over the entire range.

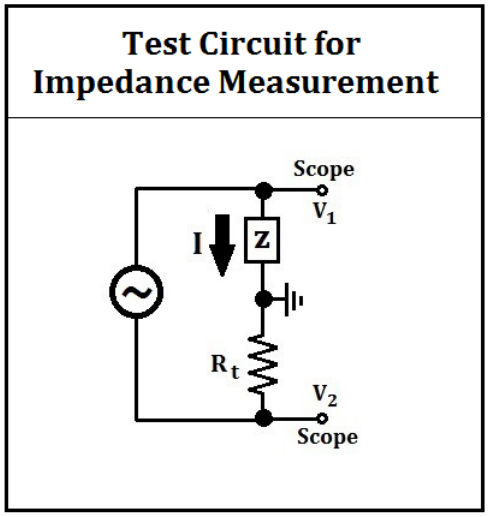

Figure 2: Test circuit used to measure impedance of the unknown circuit element labelled z.