Equipment

Test board

2.2k&#8486; Resistor

0.33 &#181;F [Capacitor](figs/ceramic_caps2.jpg)

Part A: Measuring the Transfer Function

Measuring the transfer function of an RC circuit is considerably more involved than measuring the attenuation of a resistive voltage divider. We have to make the measurement at a number of frequencies, and we must measure phase as well as amplitude.

* Select a 2.2k&#8486; Resistor and a 0.33 &#181;F [capacitor](figs/ceramic_caps2.jpg).
	+ Note: Ceramic capacitors use the same labeling codes as the potentiometers except that the units are picofarads (pF) instead of ohms. So a 0.33 &#181;F capacitor would be a 330,000 pF capacitor which would have the code 334 (33×104).
* Wire the following circuit:

* Connect the FGEN to supply vin and the oscilloscope to measure vout.
* Using the technique described in the previous section, measure the frequency response of the circuit at the following frequencies: 20 Hz, 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz, and 20 kHz.
* **Plot the magnitude of the transfer function vs. frequency** on loglog axes and the phase on semilog axes. This can be done by hand or in Matlab.
* Using Matlab, compute and plot the expected transfer function for the circuit you built. **How well does this compare with what you measured?**
* Leave this circuit assembled. We will use it in the next experiment.