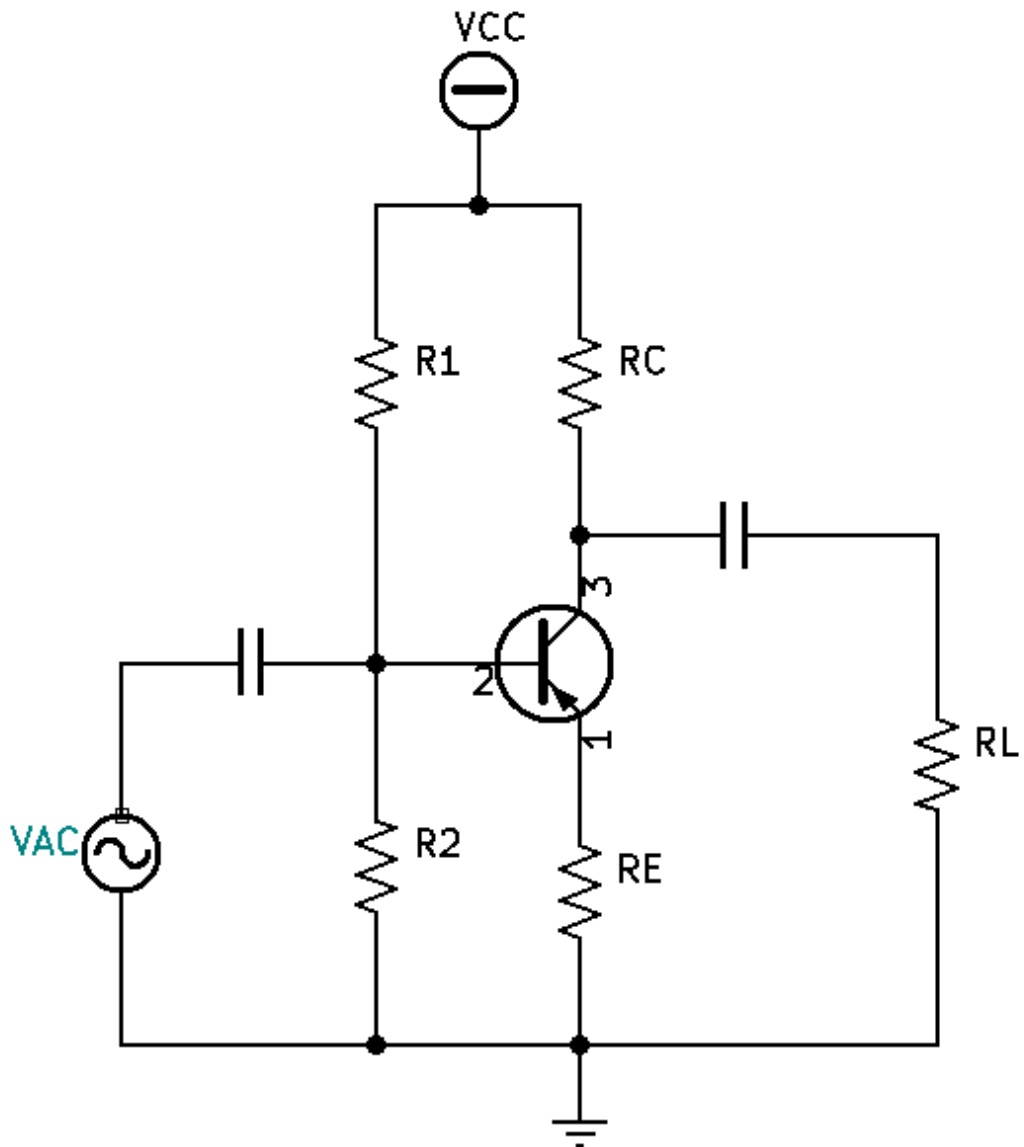
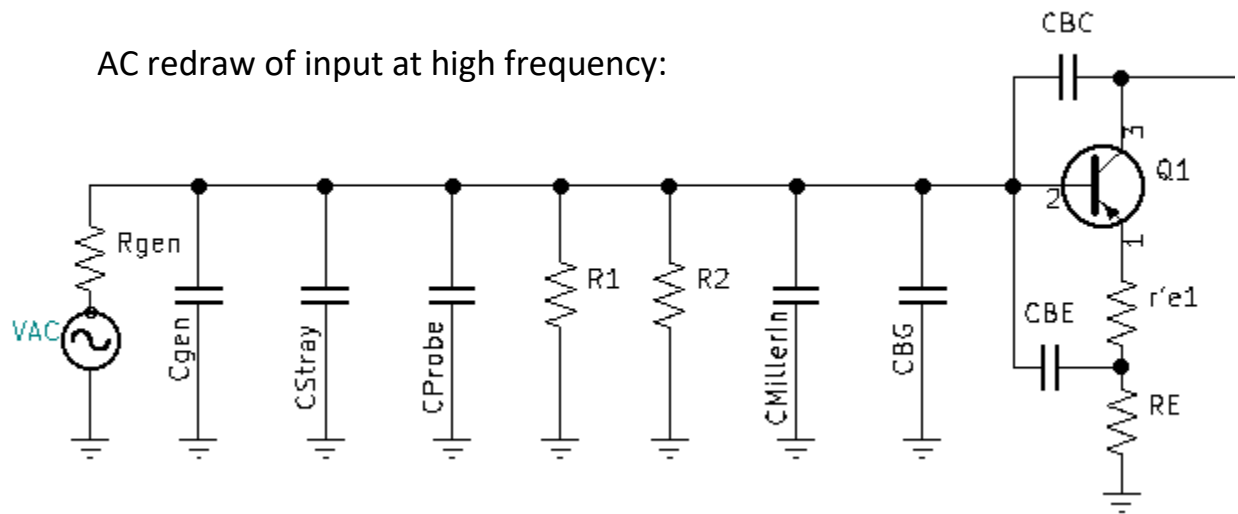


fch Common Emitter:

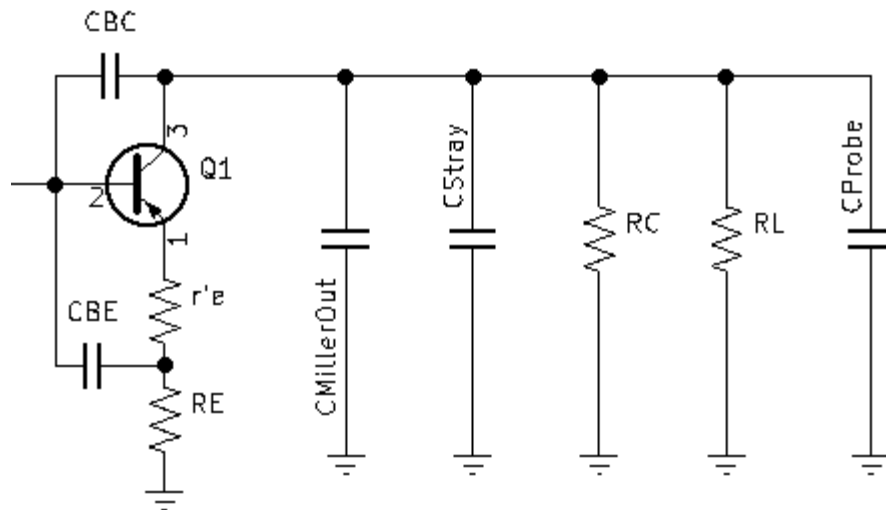


AC redraw of input at high frequency:



- Find $C_{total_{in}}$:
 - $C_{total_{in}} = C_{gen} + C_{stray} + C_{probe} + C_{miller_{in}} + C_{BG}$
 - $C_{gen} = \text{Measure, look up Specification in Manual}$
 - $C_{stray} \approx 10\text{pf}$
 - $C_{probe} \approx 16\text{pf}$ Measure, Specification in Manual
 - $C_{miller_{in}} = C_{obo}(1 + \Delta v_{CE})$
 - $C_{obo} = \text{transistor data sheet value}$
 - $\Delta v_{CE} = \frac{V_{out}}{V_{in}} = \frac{i_c(RC//RL)}{i_e(r'e+RE)} = \propto \frac{(RC//RL)}{(r'e+RE)}$
 - $C_{BG} = C_{BE}(1 - \Delta v_{CC})$
 - $C_{BE} = \frac{1}{2\pi f_{\tau} r'e}$
 - $\Delta v_{CC} = \frac{RE}{r'e+RE}$

AC redraw of output at high frequency:



- Find $C_{total_{out}}$:

- $C_{total_{out}} = C_{miller_{out}} + C_{stray} + C_{probe}$

- $C_{miller_{out}} = C_{obo} \left(\frac{1 + \Delta v_{CE}}{\Delta v_{CE}} \right)$

- $C_{obo} = \text{transistor data sheet value}$

- $\Delta v_{CE} = \frac{V_{out}}{V_{in}} = \frac{i_c(R_C // R_L)}{i_e(r'_e + R_E)} = \propto \frac{(R_C // R_L)}{(r'_e + R_E)}$

- $C_{stray} \approx 10\text{pf}$

- $C_{probe} \approx 16\text{pf}$ Measure, Specification in Manual

Calculate fch_{total} :

- Find fch_{in} :

$$\circ fch_{in} = \frac{1}{2\pi \times C_{total_{in}} \times R_{th_{in}}}$$

$$\blacksquare R_{th_{in}} \approx R_{gen}$$

$$\blacksquare R_{th_{in}} = ((RE + r'_e)(B + 1)) // R1 // R2 // R_{gen}$$

- Find fch_{out} :

$$\circ fch_{out} = \frac{1}{2\pi \times C_{total_{out}} \times R_{th_{out}}}$$

$$\blacksquare R_{th_{out}} = RC // RL$$

$$\bullet fch_{total} = \frac{0.35}{\sqrt{\left(\frac{0.35}{fch_{in}}\right)^2 + \left(\frac{0.35}{fch_{out}}\right)^2}}$$