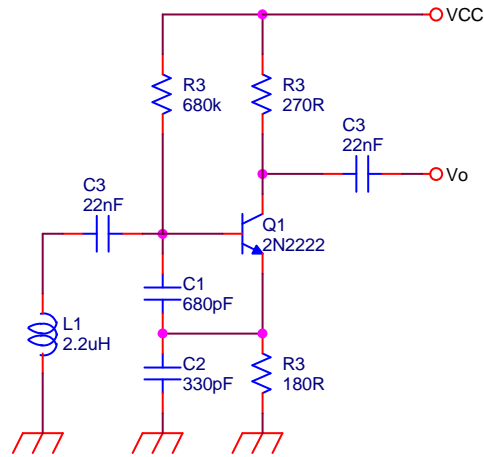


Handout LC Oscillators

The schematic given below shows an LC oscillator circuit, designed to operate at frequencies around 6MHz.



DATA: $V_{CC}=5V$; Q1: $I_{CQ}=0,75mA$, $V_{BE}=0,7V$, $h_{FE}=125$, $V_T=25mV$;

- 1) Draw the small-signal equivalent circuit for the oscillator, and simplify it for the frequencies of operation, explaining all assumptions made.
- 2) Compute the expression for the loop gain.
- 3) Compute the value of the oscillation frequency.
- 4) Assuming 5% tolerance for R3, compute its value so that oscillator start up is ensured.