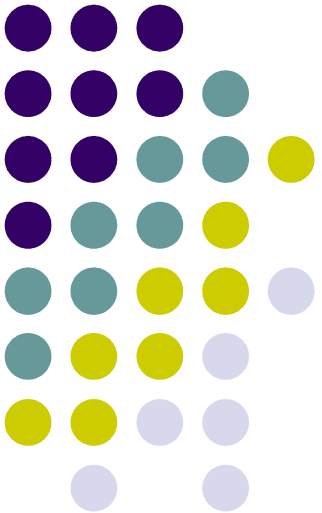
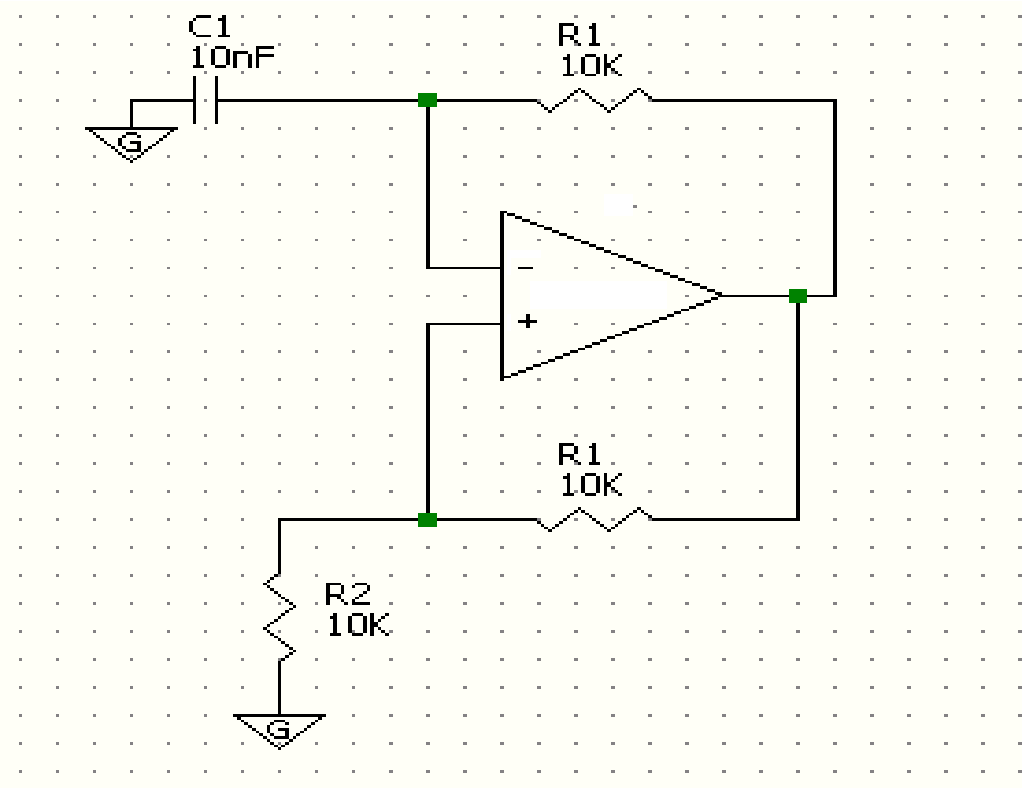
Oscillator

- ✓ Basic
- ✓ Type of Oscillator

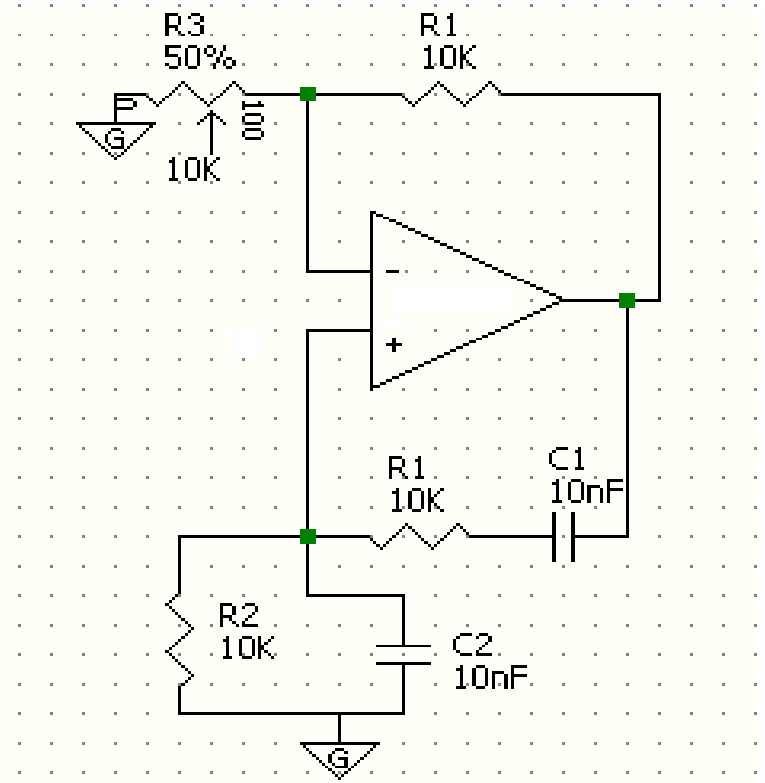


RC Oscillator



T=2.2RC

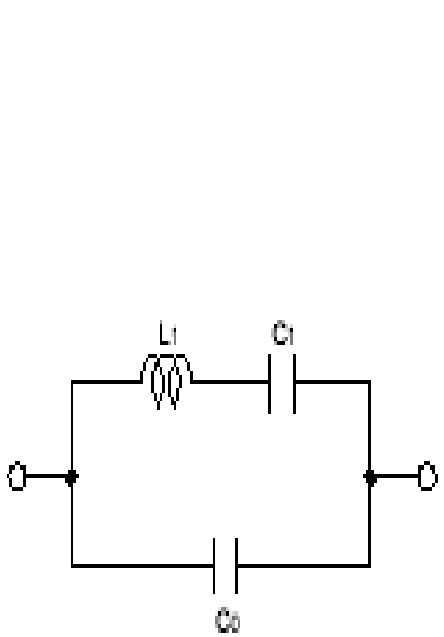
Wein Bridge Oscillator

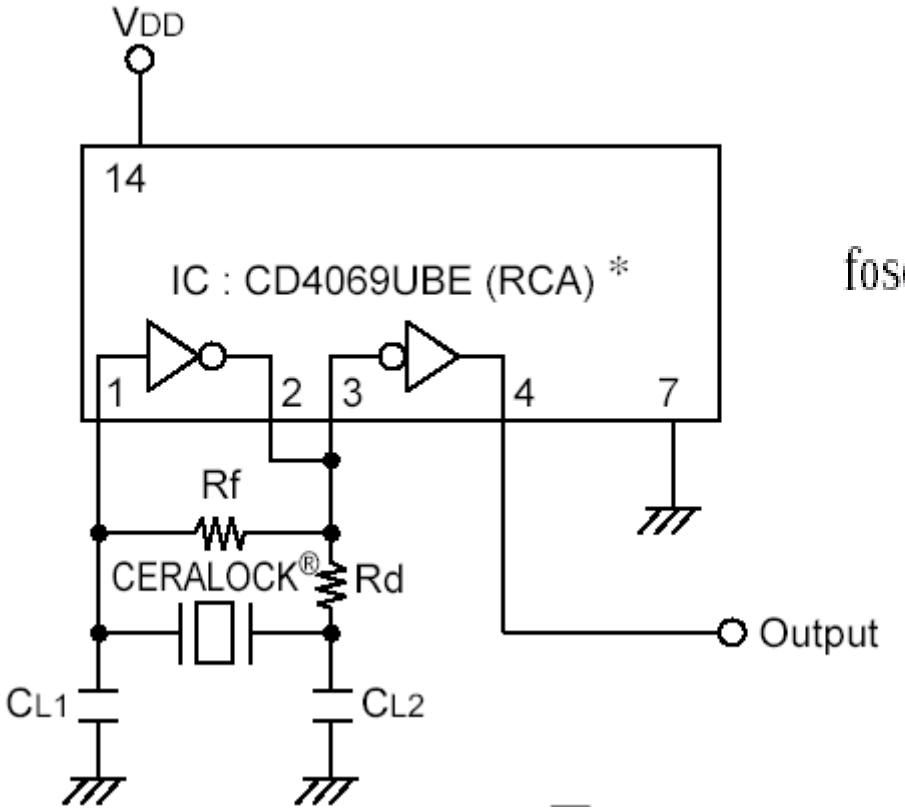


$f=1/2\pi RC$

- Positive Feedback

CMOS Inverter Oscillator



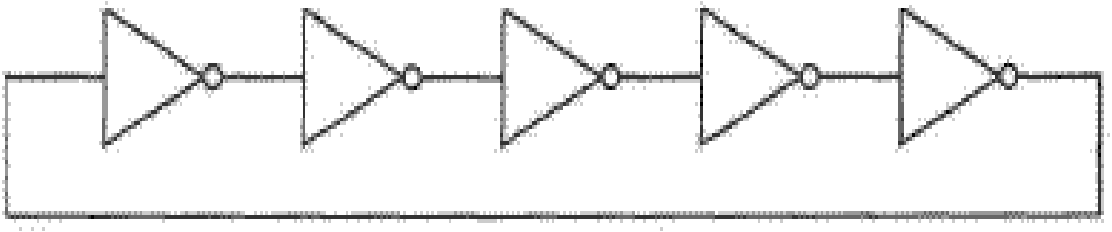


$$fosc.=Fr\sqrt{1+\frac{C_1}{C_0+C_L}}$$

$$C_L=\frac{C_{L1}\cdot C_{L2}}{C_{L1}+C_{L2}}$$

- The feedback resistance Rf provides negative feedback around the inverter in order to put it in the linear region, so the oscillation will start, when power is applied.

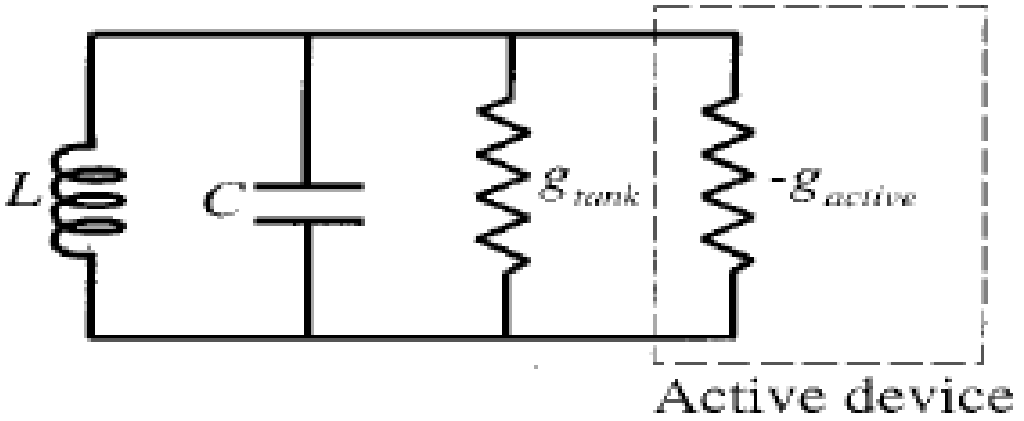
Ring Oscillator



$$f = \frac{1}{T} = \frac{1}{2 \cdot n \cdot \tau_{INV}}$$

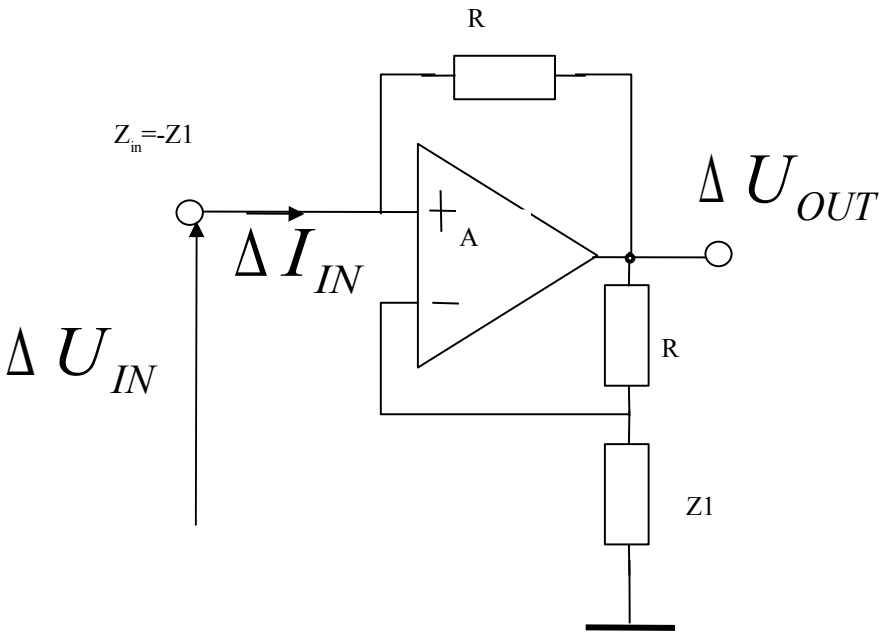
- Every half-period the signal moves at a circle motion with inversion. For example, let us consider the first inverter output changing by 1. This change will be transferred through all five inverters in a time T/2, when the first inverter output will change to 0; then in a time T/2 the first inverter output will change back to 1 and so on.

Negative Resistance Oscillator



$$\omega = 1/\sqrt{LC}$$

Negative Resistance Oscillator



Negative impedance converter Circuit