

Oscillator with current-controlled frequency

The principle of this circuit is based on the current-controlled Wien bridge built up by four diodes of the type 1N4148 and by two capacitors of the same capacitance, C . Current is fed to the bridge by means of the current-mode amplifier of the National Semiconductor LM3900.

For an amplifier of this type, which can be taken as a "super" transistor with a β of 10^6 , small variations of input voltage v_i result in frequency changes over a wide frequency range.

The resonant frequency of the oscillator is directly proportional to the control current. The circuit designed can operate in the frequency range from about 10Hz to 50kHz in which the proportionality between current and frequency holds. In this range the changes in frequency are caused by current variations from about 1 to $10^4 \mu\text{A}$. The recommended value of C is 700pF. Assuming an ideal operational amplifier, the voltage gain needed is $R_2/(R_1 + R_2) > 3$.

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