

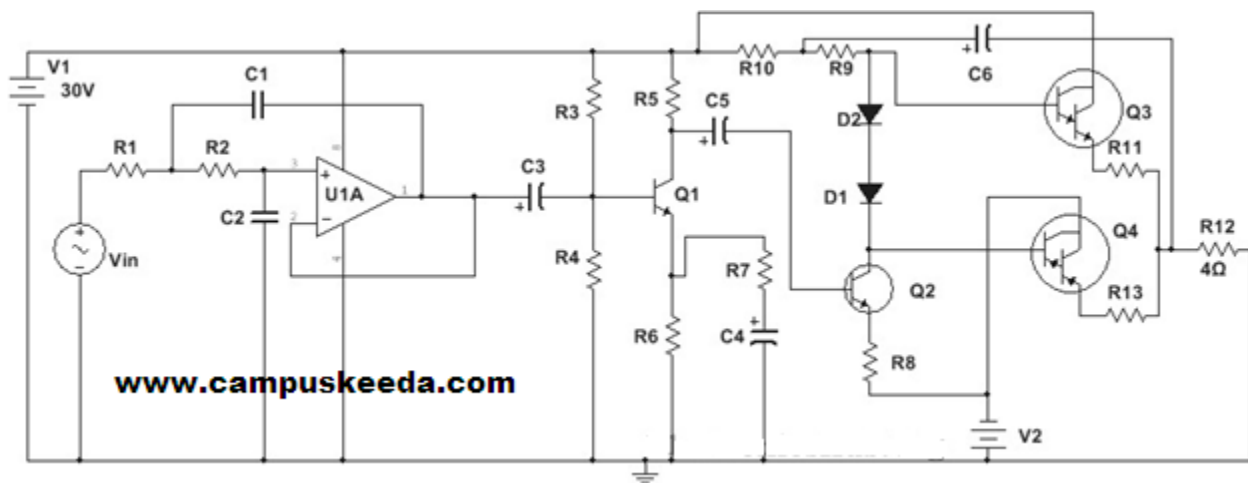
100W Subwoofer Amplifier Circuit

A Subwoofer is a loudspeaker which produces audio signals of low frequencies. The first subwoofer amplifier was developed in 1970 by Ken Kreisler. It is basically used to improve the bass quality of audio signals. Here we design a subwoofer amplifier producing audio signals at low frequencies from 20 Hz to 200Hz and with an output power of 100W, used to drive a 4 ohm load.

Subwoofer Amplifier Circuit Principle:

Audio Signal is first filtered to remove the high frequency signals and allow only the low frequency signals to pass through it. This low frequency signal is then amplified using a voltage amplifier. This low power signal is then amplified using a transistor driven class AB power amplifier.

Circuit Diagram



Subwoofer Amplifier Circuit Operation:

The audio signal is filtered by the Sallen Key low pass filter using the OPAMP such that only frequencies below and equal to 200Hz are passed and remaining filtered. This low frequency signal is given to the input of the transistor Q1 through the coupling capacitor, C3. The transistor operates in class A mode and produces a amplified version of the input signal at its output. This amplified signal is then converted into a high impedance signal by Q2 and is given to the class AB power amplifier. The two Darlington transistors operate such that one conducts for positive half cycle and other for negative half cycle, thus producing a full cycle of output signal. The emitter resistors R11 and R13 are used to minimize any difference

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between the matching transistors. The diodes are used to ensure minimal cross over distortion. This high power output signal is then used to drive a loudspeaker or subwoofer of low impedance, about 4 Ohms. Note that here we have used an 8 Ohm resistor for testing purpose.