ANALOG CIRCUITS 2

Project Report

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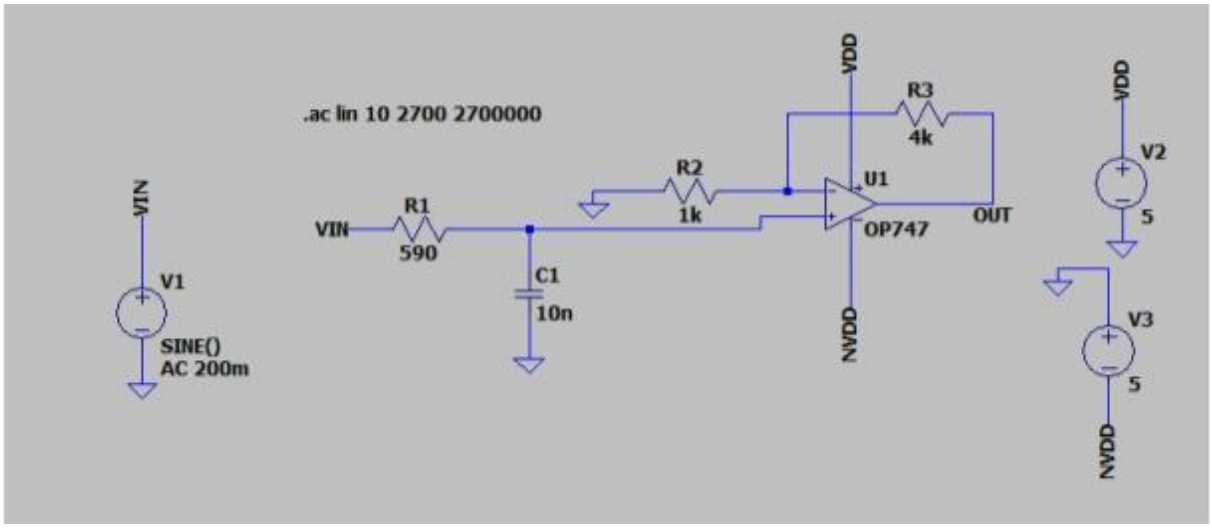
Name of the Circuit and the function

Active low pass filter (LPF):

A low pass filter circuit allows low frequency signals to pass through while attenuating high frequency signals. It consists of passive components like resistors and capacitors or active components like operational amplifiers. The cutoff frequency determines the point at which the filter starts attenuating the signal.

Schematic photo

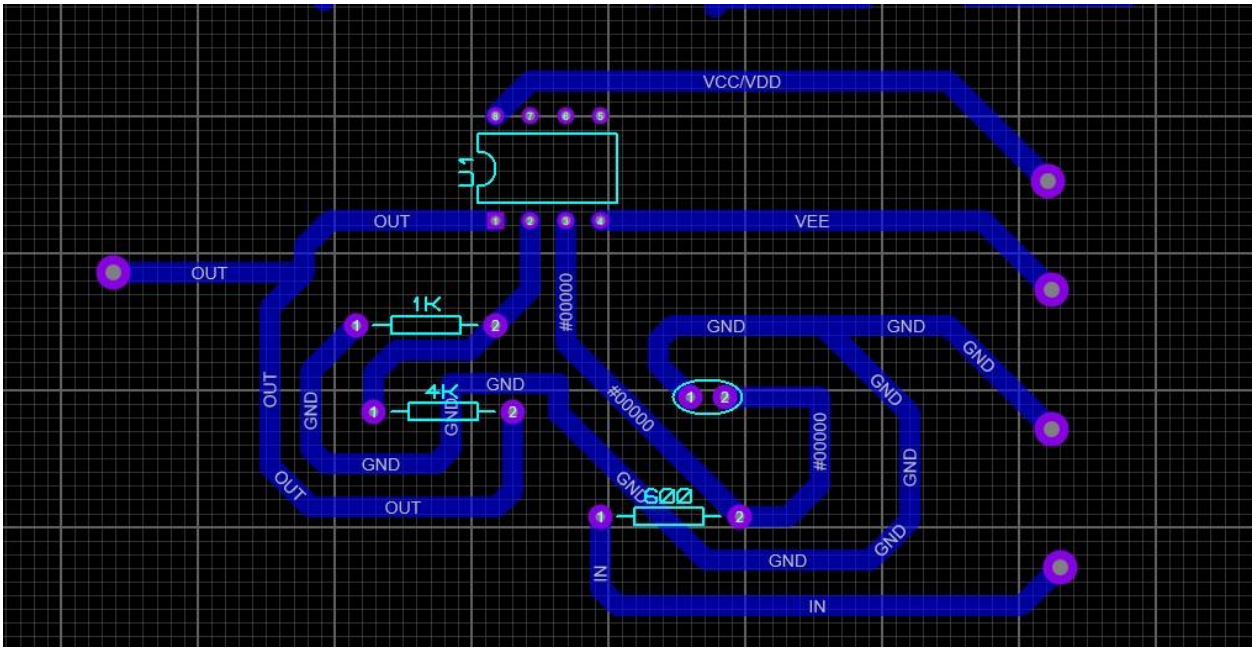


Measured Values

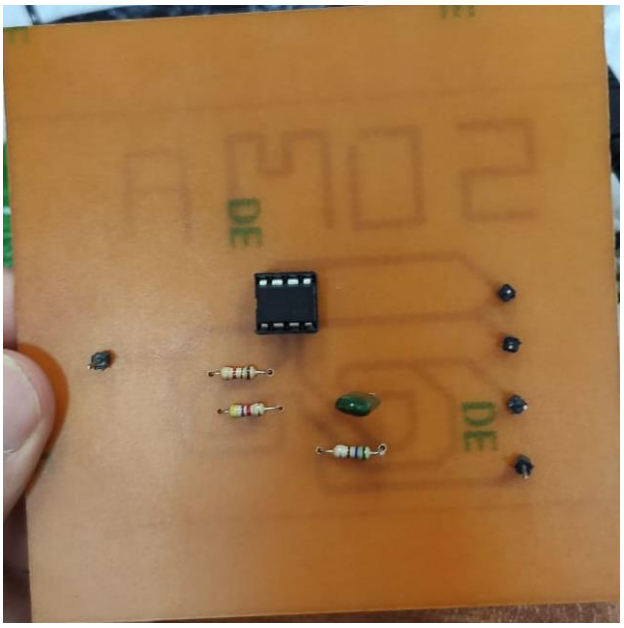
Frequency (Hz)	Vout (P-P)(V)
100	1.52
10K	1.36
15K	1.24
20K	1.16
23K	1.08
26K	1.04
40K	800m
70K	440m
100K	280m

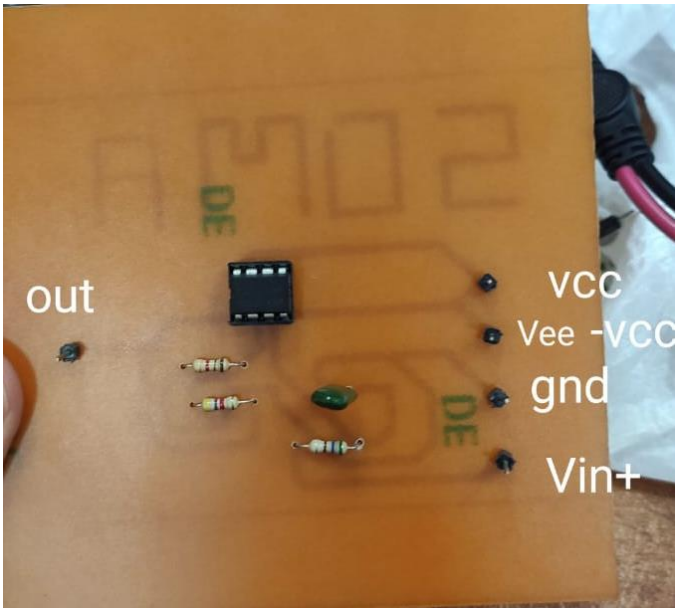
Fc≈26k Hz

layout photo + components photo



PCB photo





advantages

Active low pass filters (LPF) have several advantages over passive LPFs:

1. Gain : Active LPFs can provide gain, which is not possible with passive filters. This can be useful in applications where signal amplification is needed along with filtering.

2. Impedance matching: Active filters can be designed to have a low output impedance and a high input impedance, which can help in matching the filter with other components in the circuit without significant signal loss.

3. Adjustable parameters: Active filters often allow for easier adjustment of filter parameters such as cutoff frequency and Q-factor, which can be advantageous in applications where the filter characteristics need to be fine-tuned.

4. Low sensitivity to loading effects : Active filters are less sensitive to loading effects compared to passive filters, which can lead to more stable performance in practical circuits.

5. Improved selectivity : Active filters can provide sharper roll-off characteristics and better selectivity compared to passive filters, allowing for more precise filtering of specific frequency bands.