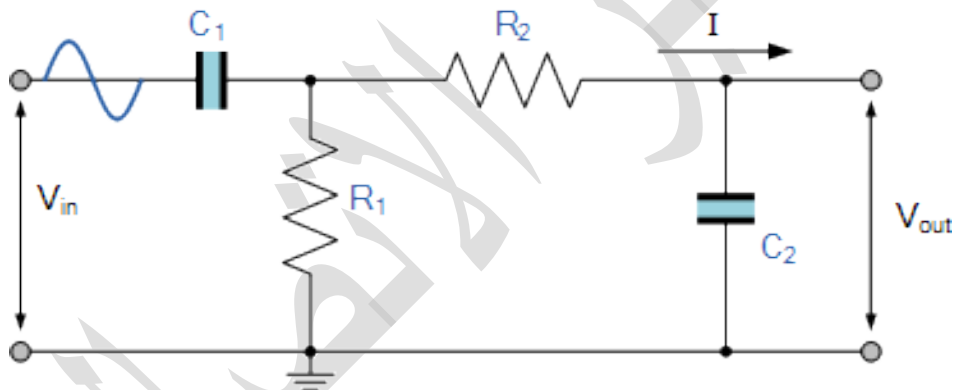


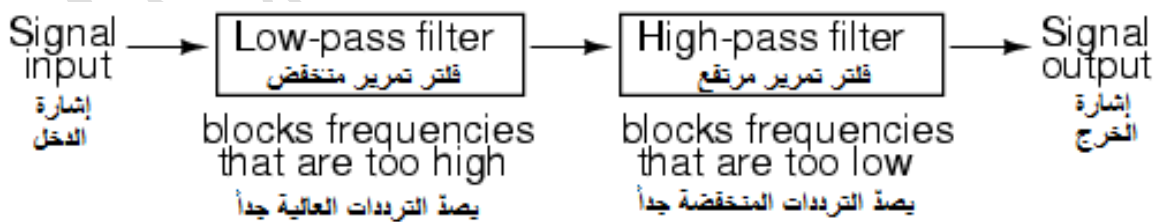
EXP (3)

EXP NAME : Band pass Filter

Band Pass Filters can be used to isolate or filter out certain frequencies that lie within a particular band or range of frequencies. The cut-off frequency or f_c point in a simple RC passive filter can be accurately controlled using just a single resistor in series with a non-polarized capacitor, and depending upon which way around they are connected, we have seen that either a Low Pass or a High Pass filter is obtained.



Fig(1) Band pass filter circuit



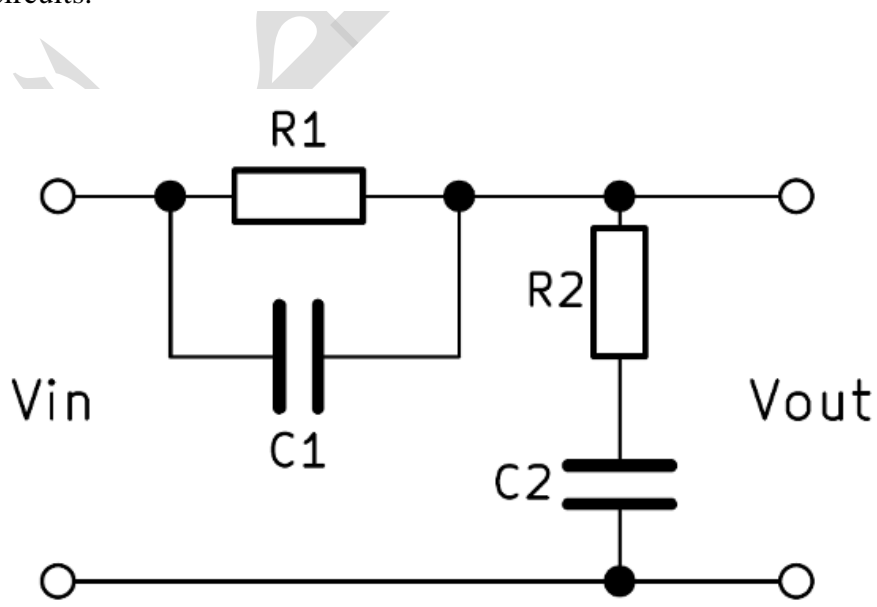
Fig(2) Block diagram of Band pass filter

frequency	Vout	Vin	Gain (Vout/Vin)	20logGain	T=1/f
1KHZ					
2KHZ					
3KHZ					
5KHZ					
10KHZ					

EXP NAME : Band stop Filter

Passive band stop filter 1st order

A band stop 1st order is created in principle by the parallel connection of a high pass and a low pass of the 1st order. Thus, two ohmic resistors and two capacitors are needed, which is why this circuit is also called RC band stop filter. The output voltage V_{out} is tapped in the middle of the two circuits.

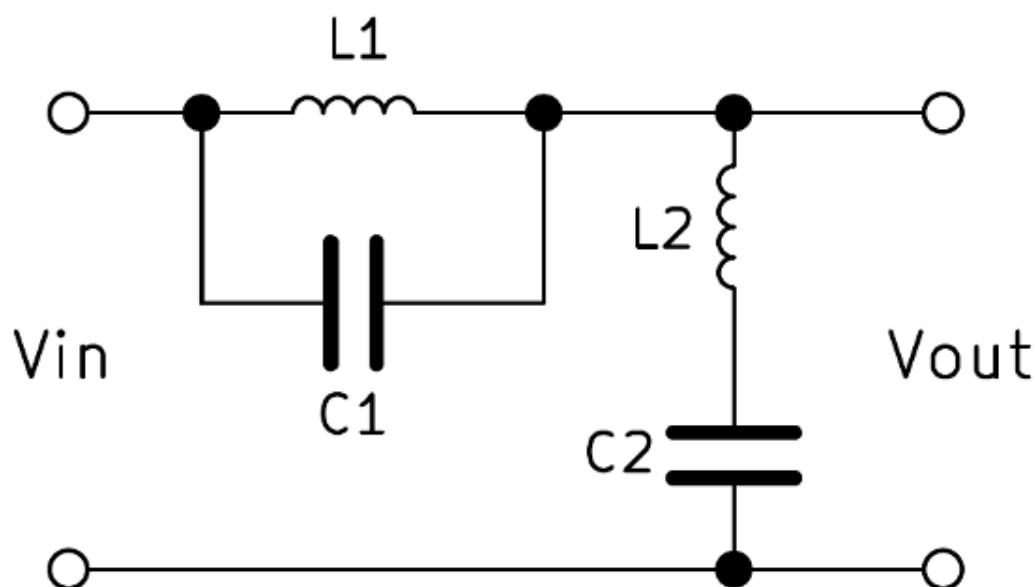


Fig(4) Band Stop filter circuit 1st order

With a frequency at the input, the voltage drop across the two circuits changes, and so does the ratio between input and output voltage respectively. High frequencies pass through the high-pass filter, and low frequencies – through the low-pass filter. By dimensioning the resistors and capacitors, the center region is determined in which there is almost no voltage at the output.

Band stop filter 2nd order

A band stop filter (band reject filter) of the 2nd order is constructed identically to the filter of the 1st order. The replacement of the ohmic resistance against an inductance increases the order. A higher order means that the filter effect becomes stronger and the transition areas smaller. A 2nd order filter has twice as much edge steepness as a 1st order filter. By interconnecting further band stop filters, the order can be increased even further.



Fig(5) Band Stop filter circuit 2nd order

Functions of LC band reject filter

Like the construction, the functions are also very similar to the 1st order band stop filter circuit. However, the inductance also has a reactance X_L , which is inversely proportional to the capacitive reactance X_C . This means that as the frequency increases, the reactance of the capacitor decreases and the reactance of the coil increases simultaneously. As a result, the filter effect is significantly increased and frequency changes at the input can be seen more clearly at the output.

frequency	Vout	Vin	Gain (Vout/Vin)	20logGain	T=1/f
1kHz					
2KHZ					
5KHZ					
5KHZ					
10KHZ					

Dissociation

Q1\ where Band Pass Filters can be used ?

Q2\ What happens if the components in the circuit are flipped and made LPF instead of HPF ?

Q3\ How The cut-off frequency or f_c point in a simple RC ?

Q4\ How A band stop 1st order is created?