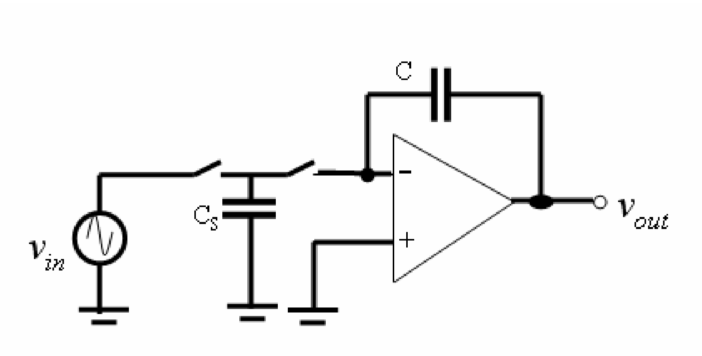
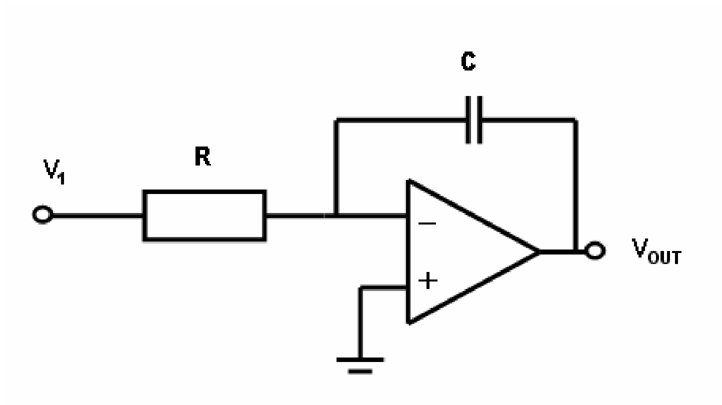
1. The following switched capacitor structure simulates an active RC integrator. Let C=5pF, the equivalent resistance 1.5 MΩ can be realised by a switched capacitor C_s. The value of C_s is determined by R= 1/(f_{CLOCK} C_S), based on the property of resistance (R= V/I, where I is dQ/dt). Therefore
C_S=1/[(512,000)(1,500,000)]=1.3pF.



2. The give switched capacitor structure simulates an active RC integrator. Let C=5pF, the equivalent resistance of switched capacitor can be determined by R= 1/(f_{CLOCK} C_S) , based on the property of resistance (R= V/I, where I is dQ/dt). Therefore
R =1/[(512,000)(0.5 E-12)]=3.9 MΩ.



3. Based on Kirchoff's Current Law at each node,

$i_{in}= i_{L2} + i_{C1}$

$i_{L2}= i_{C3} + i_{L4}$

$i_{L4}= i_{C5} + i_{out}$

$i_{out}= V_{out}/ R$

$i_{in}= (V_{in} - V_1)/ R$

and

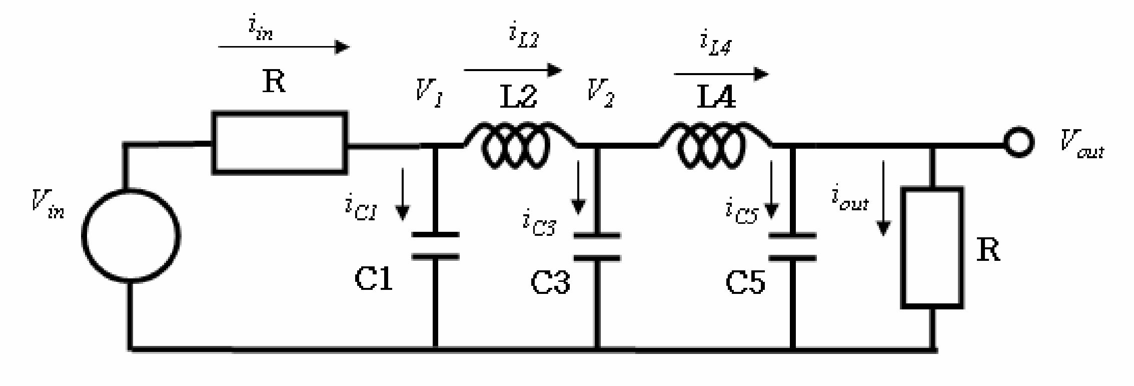
$i_{L2}=(1/s\mathbf{L2})(V_1-V_2)$

$i_{L4}=(1/s\mathbf{L4})(V_2-V_{out})$

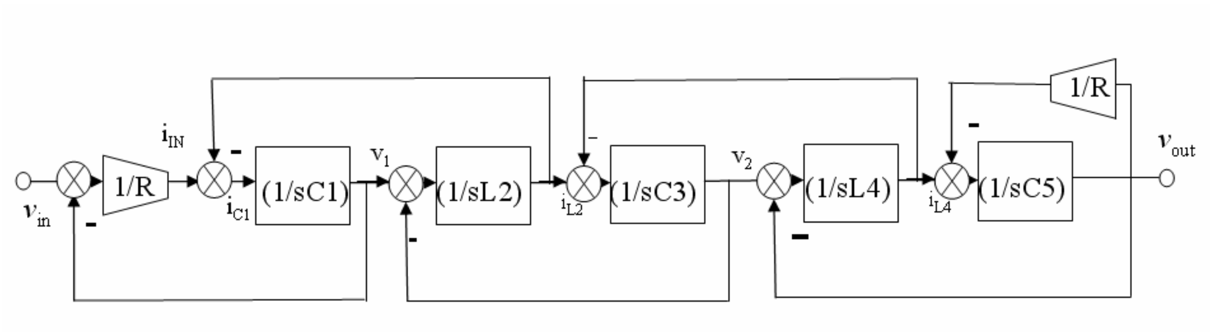
$V_1=(1/s\mathbf{C1})(i_{in} - i_{L2})$

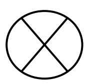
$V_2=(1/s\mathbf{C3})(i_{L2} - i_{L4})$

$V_{out}=(1/s\mathbf{C5})(i_{L4} - i_{out})$

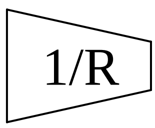


The following signal flow graph represents the equivalent filter characteristics, which is the Leap-Frog structure, based on integrators and adder (the difference calculation).

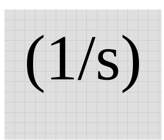




Summation symbol



Multiplier representing trans-conductance



Integrator