

Expt. 4. Simulation of Step up chopper

Aim : To perform transient analysis of step up chopper

Components required with references:

1. DC source (DC)
2. Inductor (inductor) of 10 mH.
3. Switch (analogswitch)
4. Diode (diode)
5. Capacitor (C) 100 μ F.
6. Resistor (R) of 100 Ω .
7. Voltmeters (vplot8_1)

Procedure :

1. Create the schematic of the step up chopper as shown in Fig. 4.1.
2. Annotate the schematic.
3. Test Electric rules.
4. Generate the netlist.
5. Insert analysis for transient analysis from 0 to 100 ms with a step time of 100 μ s.
6. Edit model for diode (set $bv=1800$ and $I_s=2.2E-15$).
7. Convert KiCad netlist to Ngspice netlist.
8. Simulate the Ngspice netlist using Ngspice simulator.

Conclusion : Transient analysis of step up chopper is performed using FreeEDA.

FreeEDA schematic of step up chopper :

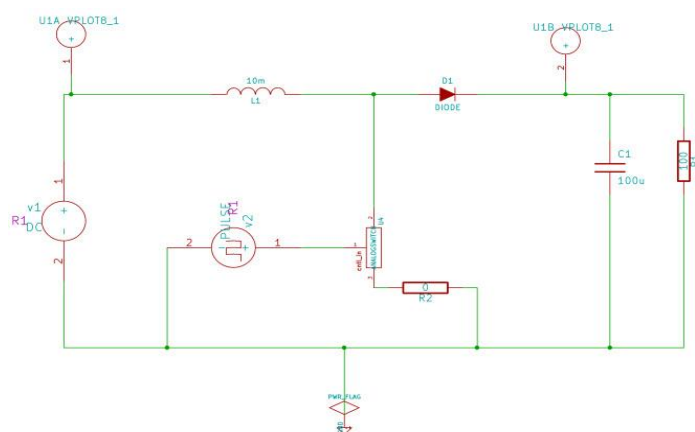


Fig. 4.1 Schematic of step up chopper

Parameters of input :

DC input : 10

Parameters of pulse :

Initial : 0
Pulsed : 5
Delay : 0
Rise time : 0
Fall time : 0
Pulse width : 10m
Pulse period : 20m

Parameters of analog switch :

On voltage : 1
Off voltage : 0.01
On resistance : 0.0125
Off resistance : 1M

Simulation Results :

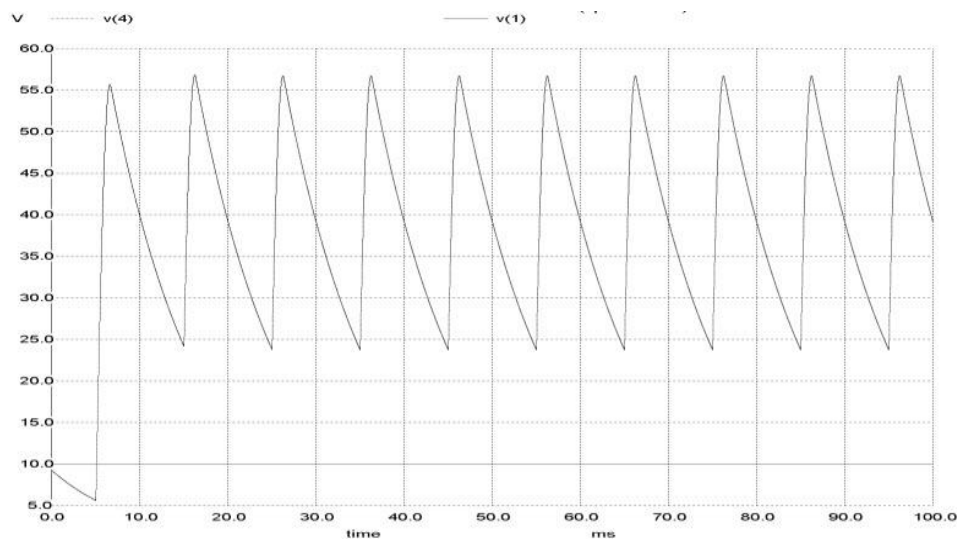


Fig. 4.2 Simulated output for step up chopper