Circuit Simulation Project

https://esim.fossee.in/circuit-simulation-project

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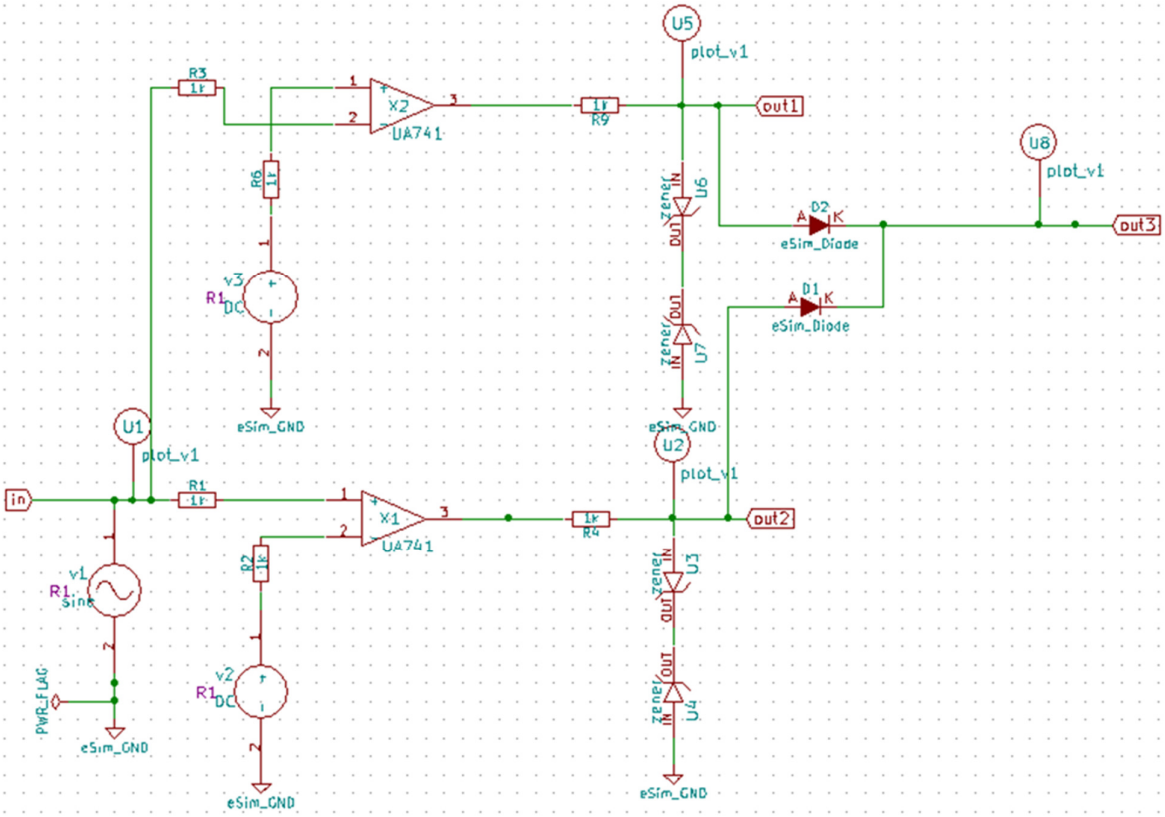
Title of the circuit: Three Level Comparator

Theory/Description: A Three Level Comparator, also called window detector circuit or window comparator circuit or dual edge limit detector circuits is used to determine whether an unknown input is between two precise reference threshold voltages. It employs two comparators to detect over-voltage or under-voltage.

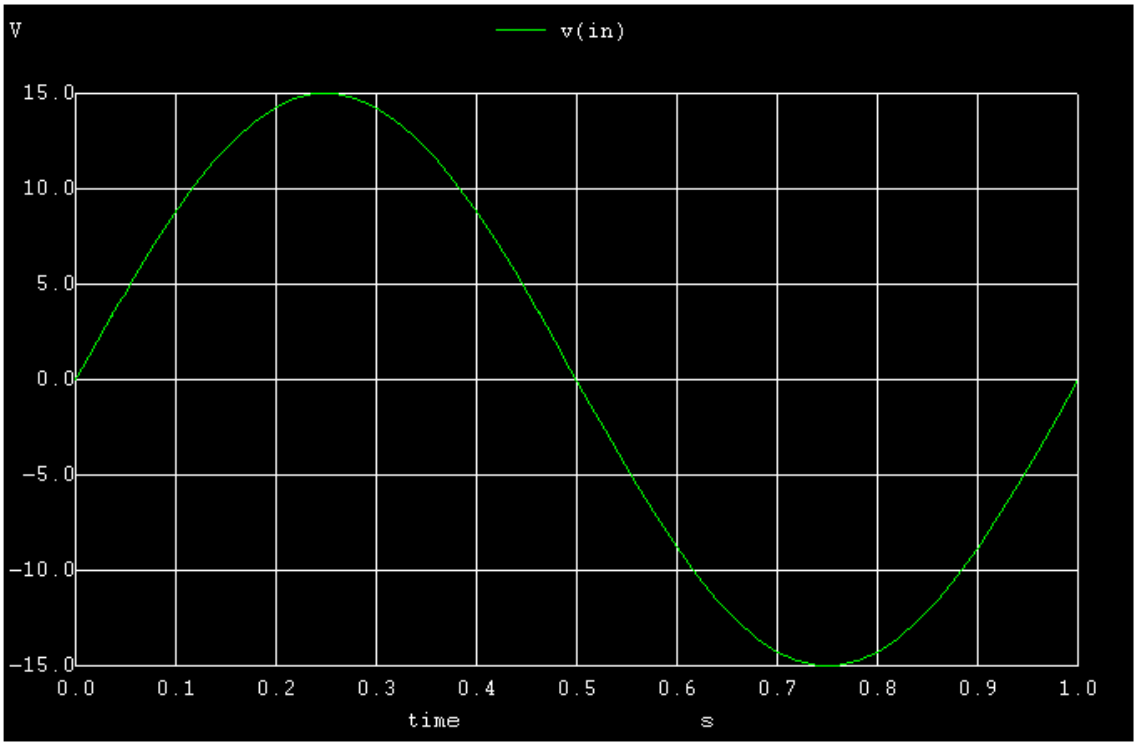
Each single comparator detects the common input voltage against one of two reference voltages, normally upper and lower limits. Outputs behind a logic gate like AND detect the input as in range of the so-called "window" between upper and lower reference.

Circuit Diagram(s):

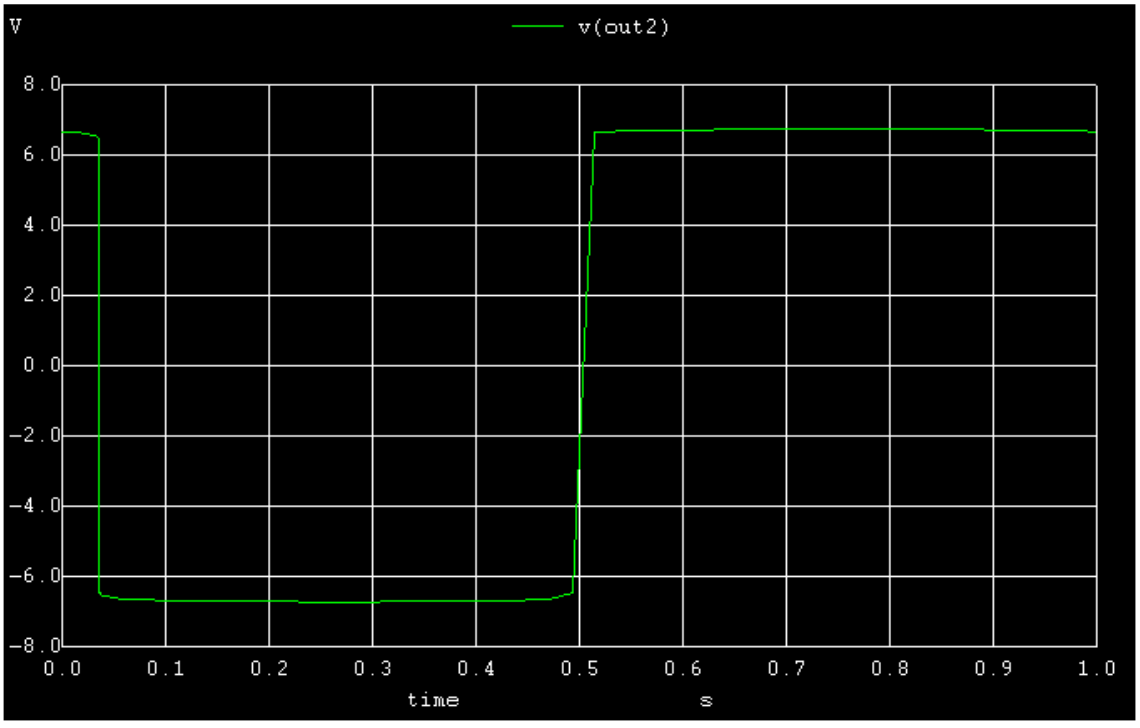


Results (Input, Output waveforms and/or Multimeter readings):

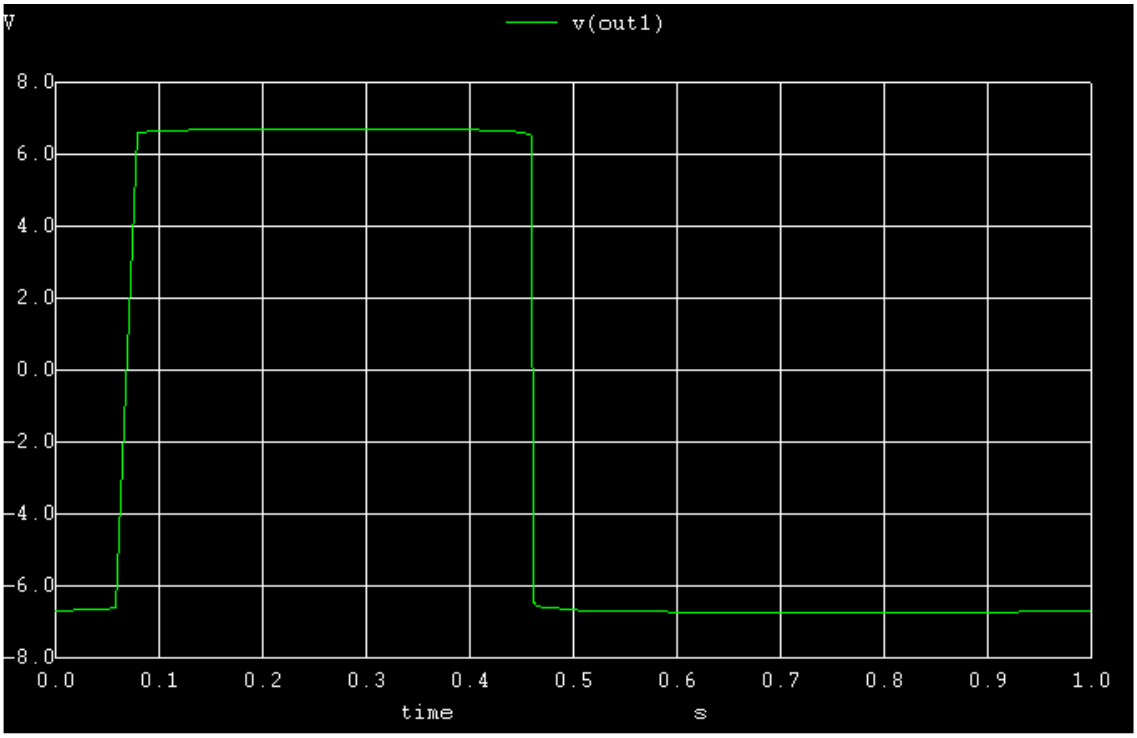
Ngspice Plots- Input Signal



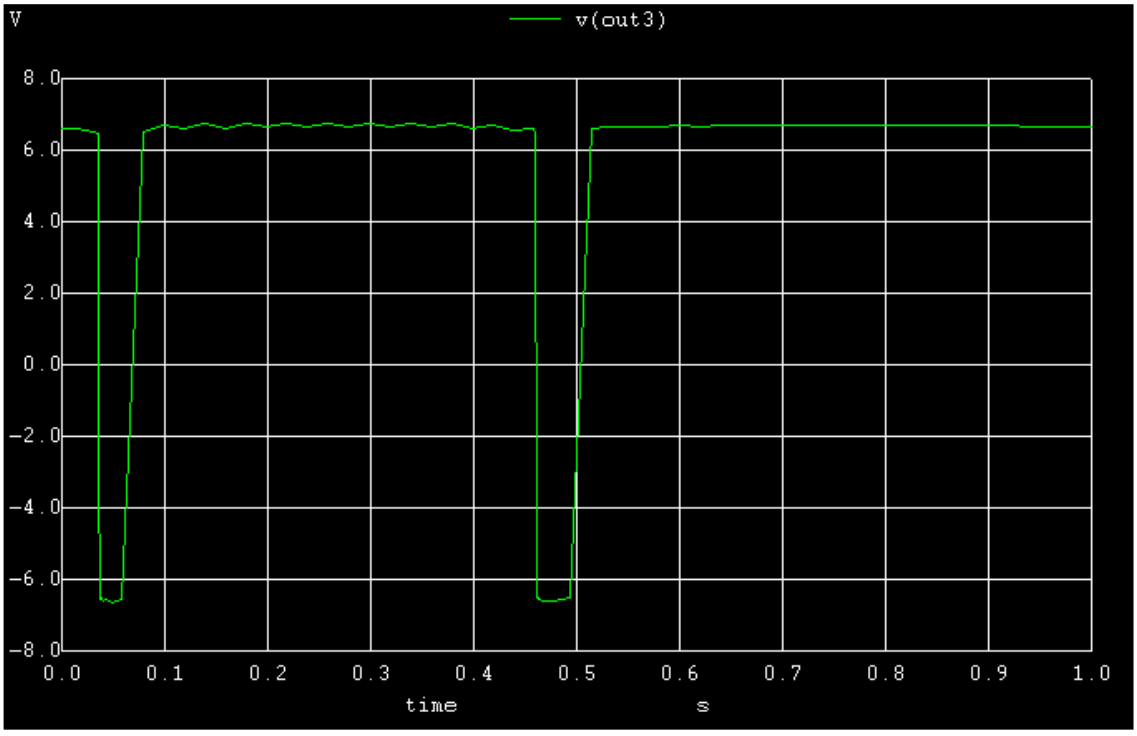
Ngspice Plots- Output of Comparator 1



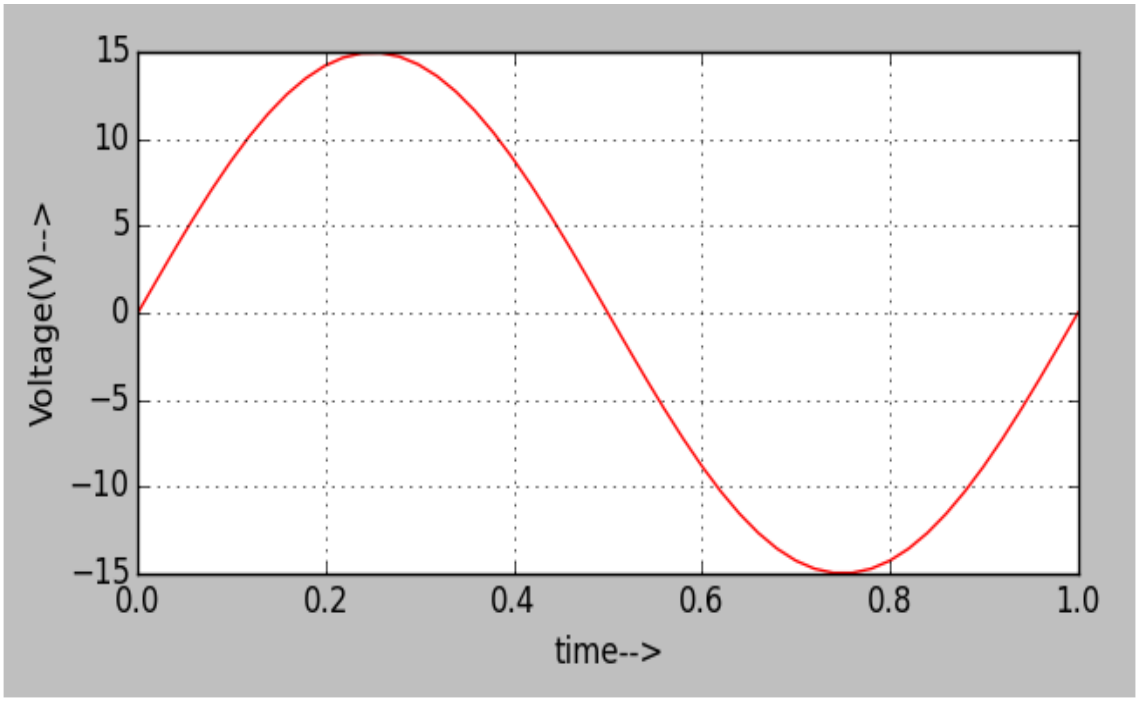
Ngspice Plots- Output of Comparator 2



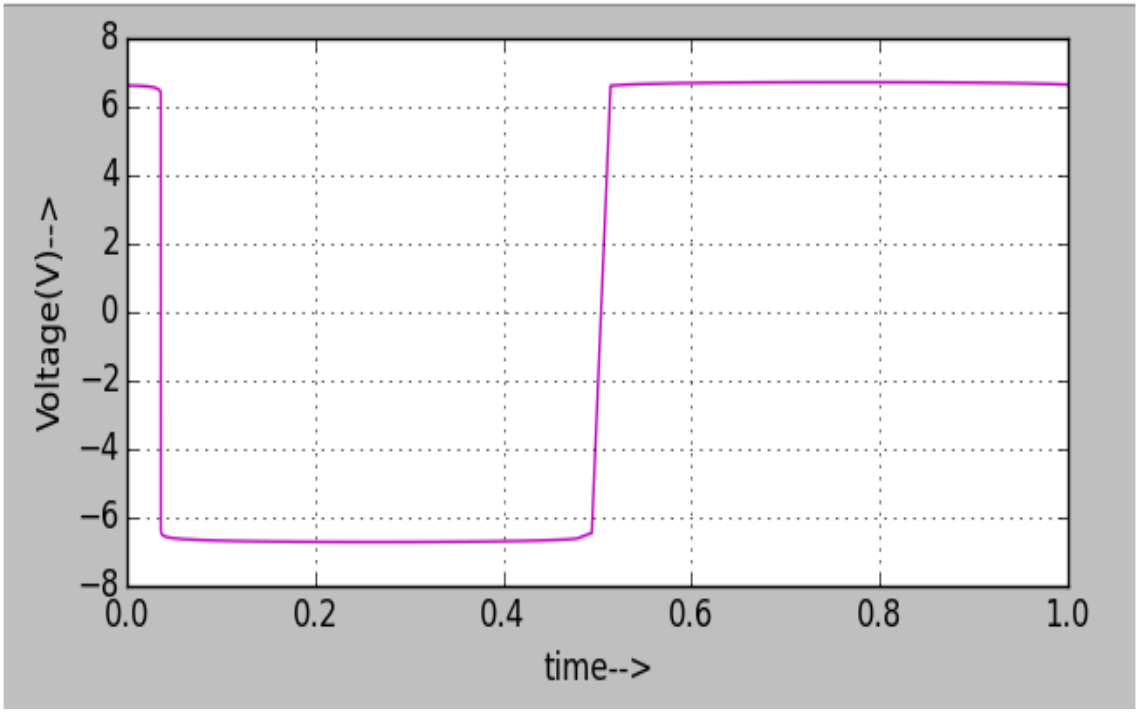
Ngspice Plots- Final Output Signal



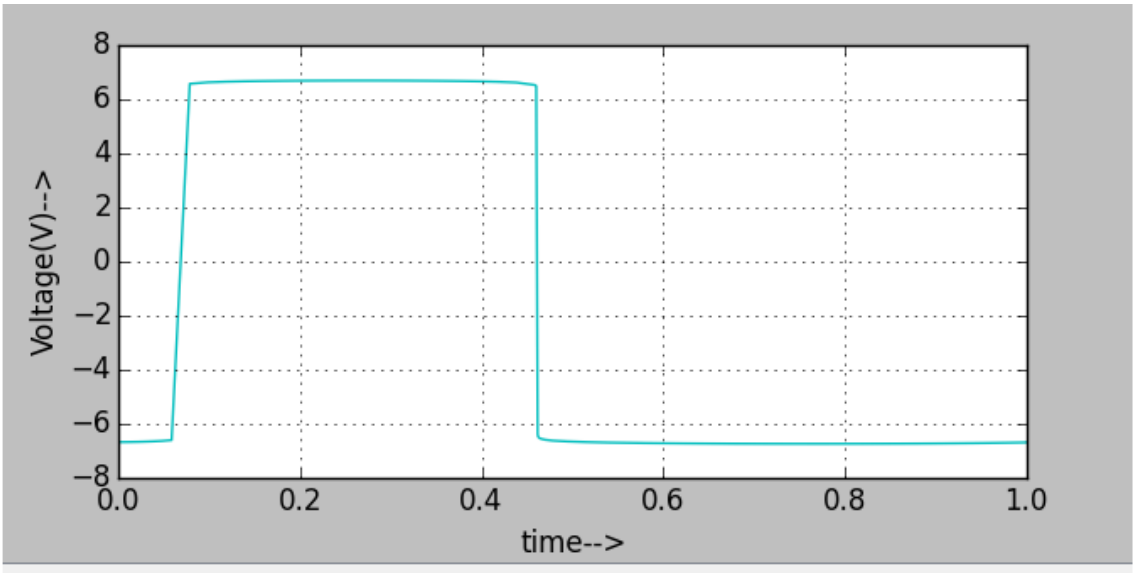
Python Plots- Input Signal



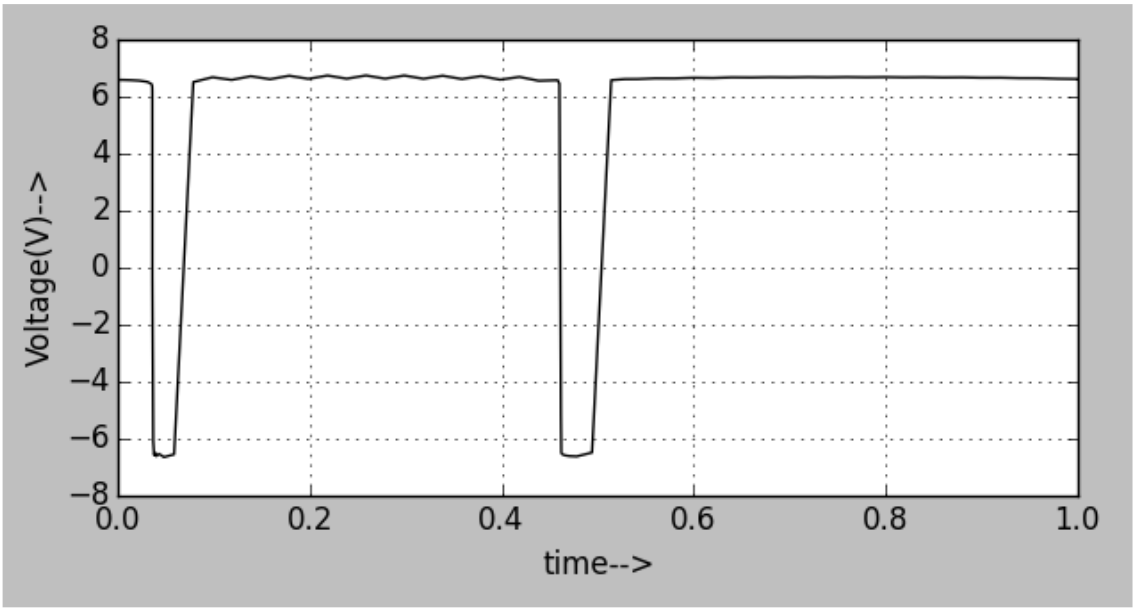
Python Plots- Output of Comparator 1



Python Plots- Output of Comparator 2



Python Plots- Final Output Signal



Conclusion: Thus, we have studied the Three Level Comparator and the simulation plot of ngspice and python plot obtained in eSim.

Source/Reference(s):

1) https://www.sanfoundry.com/linear-integrated-circuit-mcqs-comparator/
2) https://en.wikipedia.org/wiki/Window_detector