- Part 2

<u>Single switch matrix</u>

In this part, the single switch matrix is needed to be designed using six pass transistors. So as the first step, a pass transistor was designed and its performance was checked. Simply an 'NMOS' transistor is fed with a switch, could be used for this task. So when the switch is on, the input signal will be received at the output (Threshold voltage is considering as zero since an ideal nmos). Also capacitors were used to ground the high impedance state which occurred when the NMOS is OFF.

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pass_ttr – Figure- Schematic diagram of the pass transistor
pass_wave – Figure- Waveform of the pass transistor

Then using six such transistors, the single switch matrix was designed and the schematic diagram of it is shown below.
switch_mat – Figure- Schematic diagram of the single switch matrix
block – Figure- Designed single switch matrix block

Finally the functionality of the circuit was checked by giving pulses to left, right, top, and bottom corners separately and switching on the switches at different periods.

top – Figure- Waveforms when the top terminal is fed with a pulse
left – Figure- Waveforms when the left terminal is fed with a pulse
right – Figure- Waveforms when the right terminal is fed with a pulse
bottom – Figure- Waveforms when the bottom terminal is fed with a pulse