* Part 2

Single switch matrix

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 There was a leakage voltage when the NMOS is at the high impedance state. So we used a large load to pull down the output to zero.

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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