Design and Implementation of Mixed Signal Circuit 2:1 MUX

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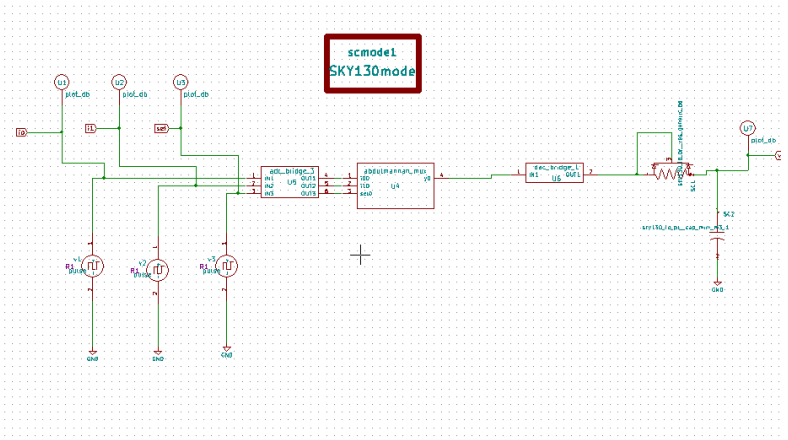
***Abstract*-I am going to Design and Implement Mixed Signal Circuit 2:1 Mux using CMOS Technology. Design and Implementation will be done using esim and Makerchip software. Mixed signal circuits contain both Digital and Analog circuits of a given circuit. MUX is a data selector which will give single output from several data inputs. Here we have implemented 2 input MUX which will give single output based on select line input. As this is a mixed signal circuit, we will have complete implementation from HDL code to schematic implementation and. We can verify the output using Circuit Waveforms. This complete design and implementation is done using VLSI technology which has features such as high speed, low power, low cost, and small size.**

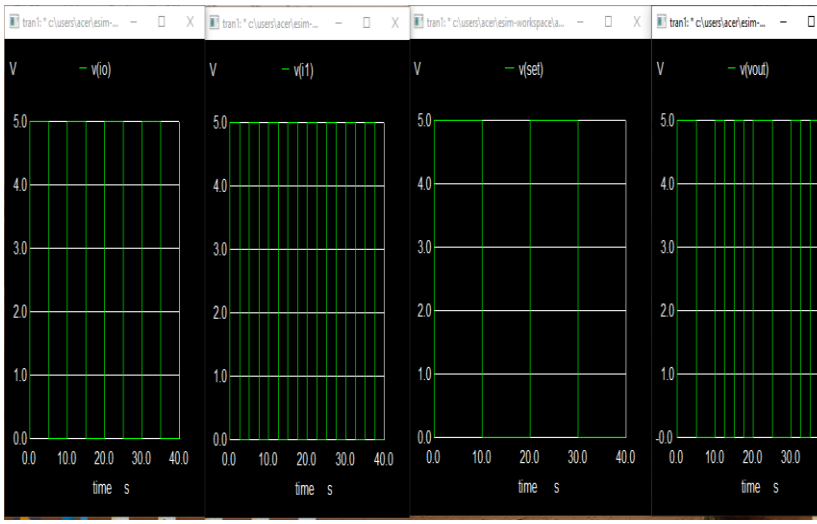
1. CIRCUIT DETAILS

Multiplexer (MUX) is a data selector which will send single input data at the output based on select line input. Here we have implemented a 2:1 MUX which has 2 inputs (A and B), 1 output (Y) and 1 select line (S). Output Y will be A or B based on 0 or 1 input at the select line (S). If the select line is "0" output Y will be A and if the select line is "1" then output Y will be B. 2:1. The equation for output Y will be $Y=AS^{bar} + BS$. The complete design is divided into two parts Digital Block and Analog Block. Here, we will be using Verilog Hardware Description Language for implementation. We will implement the code using Makerchip software and implement the Circuit schematic using esim software. We know that mixed signals contain both analog and digital blocks hence we need ADC and DAC blocks to convert the signals from analog to digital. Figure 1 shows the final circuit diagram designed using esim software and Figure 2 shows final circuit waveform containing 4 waveforms 2 inputs, select line and output. In the Circuit Waveform, we will verify the above implementation using clock pulse. Output Y will have the same clock pulse sequence as A when S will be "0" and it will have the same clock pulse sequence as B when S will be "1".

2. FINAL CIRCUIT DIAGRAM



3. FINAL CIRCUIT WAVEFORM



4. REFERENCES

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