

Implementation of Cmos Buffer Along With Mod-16 Counter for Counting Based Data Line Selection Operation

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Abstract—The CMOS buffers are the type of buffers that are likely to take in a voltage either above or below a “Switching threshold”, identify them as either logic ‘0’ or logic ‘1’ then identify them as a voltage much closer to the ideal voltages for logic ‘0’ and logic ‘1’. A MOD -16 counter has 16 states in its counting operation. A 16x1 Multiplexer is also used for data line selection operation. In this design, a sine wave generator cascaded with a CMOS buffer is connected with a MOD -16 counter followed by a 16x1 multiplexer. This design can be used for the sequential selection of data lines using counting operations

I. CIRCUIT DETAILS

The circuit has a sine wave genrator cascaded with a CMOS buffer. A buffer is a circuit that provides current gain but not voltage gain. The output of a buffer can provide more current, without changing the output voltage. CMOS buffer is formed by cascading two CMOS inverters back to back. The operation of one CMOS inverter is to invert the input signal to the opposite logic level. Thus a cascaded combination of two such circuits will bring back the input signal to the original level. This property of CMOS buffer is extremely helpful in signal restoration in communicating over long wires. The CMOS buffer here converts the input sine wave into the required square wave form. This output from CMOS buffer is given to a MOD-16 counter. A MOD-16 counter is also called a four-bit counter which has 16 states and can count from ‘0000’ to ‘1111’. After reaching the ‘1111’ state, it resets to the ‘0000’ state. Hence the counter will count from decimal ‘0’ to decimal ‘15’ only. The output of the counter is given to the 16x1 multiplexer. The multiplexer is a combinational circuit that has a maximum of ‘2n’ data inputs, ‘n’ selection lines, and a single output line. Among these data inputs, only one will be connected to the output based on the values on the selection lines. Hence a 16x1 multiplexer has 16 data input lines, 4 select lines, and one output line. The output of the MOD-16 counter is given as input to the 4 select lines of the multiplexer. So, based on the count of the counter, the corresponding data line is connected to the output line.

Figure 1 shows the reference circuit diagram and Figure 2 shows the resultant waveforms.

II. CIRCUIT DIAGRAM

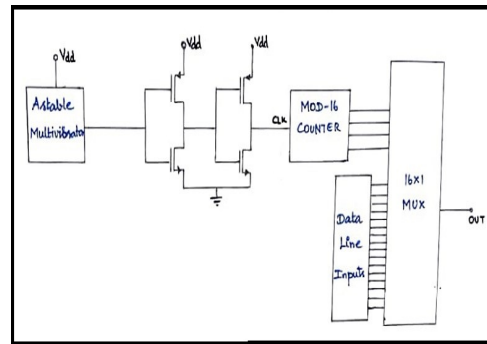


Figure 1. Circuit Diagram

III. CIRCUIT WAVEFORM

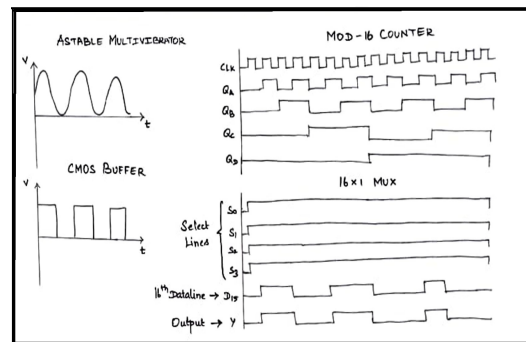


Figure 2. circuit waveform

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