

Implementation of Quadruple - Window Comparator Along with Prioritised MOD-16 Counter for Data Line Multiplexing Operation

Nalinkumar S

Department of Electronics Engineering

Madras Institute of Technology, Anna University, Tamil Nadu

Email: nalintes36@gmail.com

Abstract—To process the input signal which remains more stable between the reference voltages considering with the priority the following circuit, Window comparator along with MOD-16 counter and 4x2 Priority encoder followed by Mux is implemented in this paper. Window comparator is a circuit which uses the two comparator in parallel to determine if a signal is between two reference voltages. A MOD-16 counter has 16 states in its count sequence and used for counting operation. A 4x2 Priority Encoder is also used for encoding operation. A 4x1 Multiplexer is also used in this design for data selection operation. This design can be used for input signal comparing followed by counting and Prioritize based data line selection applications.

I. CIRCUIT DETAILS

Most of sensors produce analog outputs, Considering many Temperature sensor is placed and producing output and there is criteria to a place where the temperature is more stable between given reference range with also considering priority of the place. The following combination of circuit will be a solution. Cascading window comparator with counter and then with priority encoder and using mux will results in desired output. A window comparator is a circuit consists of two Op-Amp in parallel which can take two reference voltages V_H and V_L and an input analog voltage and produces output based on the comparison of voltages. If the given input voltage lies between two reference voltages, then the output of comparator is 'HIGH'. Otherwise, the output of comparator is 'LOW'. This output is given to a MOD-16 counter. MOD-16 counter is also called as 4 bit counter, which have 16 states and count from '0000' to '1111'. After reaching '1111' state it will be reset. The output of comparator is given to 4x2 Priority Encoder. Priority Encoder produce encoded output based on inputs. This output is fed to 4x1 Multiplexer. Multiplexer is a combinational circuit which has maximum of $2n$ data inputs, 'n' selection lines and single output line. Among these data inputs only one will be connected to the output based on the select line values. So, a 4x1 mux have 4 data input lines, 2 select lines and one output line. So, based on the output of PE 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

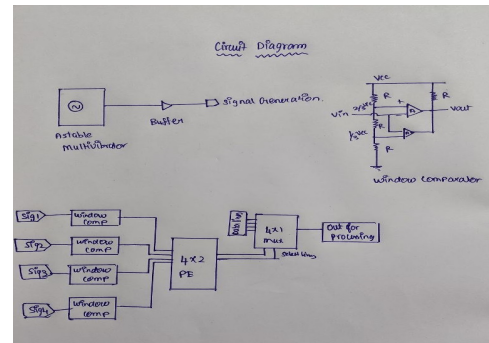


Figure 1. Circuit Diagram

III. CIRCUIT WAVEFORM

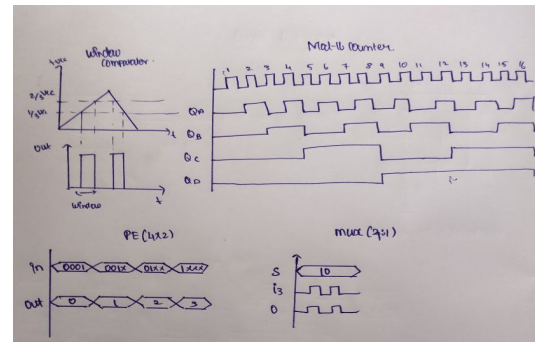


Figure 2. circuit waveform

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