

Introduction

Dynamic switching is used in order to reduce power consumption. An analog comparator generates HIGH-level signal on output when signal on positive input is higher than signal on negative input. The Analog Comparator is used when it is needed to monitor a certain level of voltage.

Dynamic Switching Comparator Circuit Design

The screen capture of dynamic switching comparator with logic output is shown on Figure 3. It was created in GreenPAK2 designer software. Reference voltage of ACMP0 is 600mV. Analog comparator is connected to PIN3, which is configured as analog input without any pull up/down resistors. Output of 2-bit LUT1 will be HIGH when IN1 is HIGH and IN0 is HIGH too. Output is configured as push-pull. Delay0 is configured to be 140µs rising edge delay.

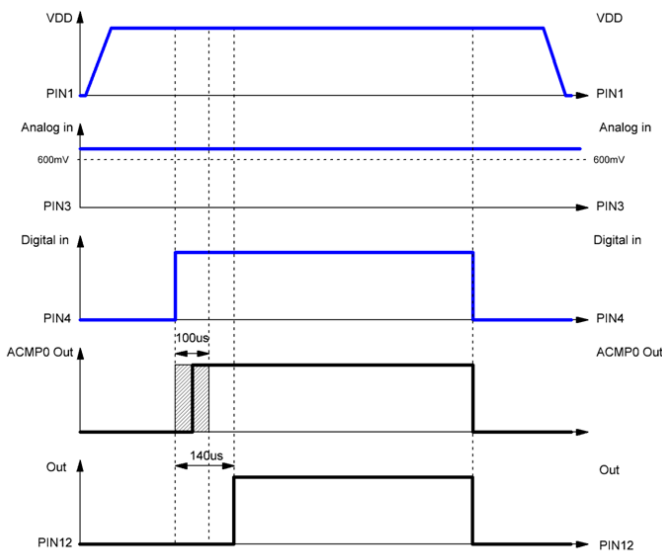


Figure 1. Dynamic switching comparator timing diagram

Dynamic Switching Comparator Circuit Analysis

Figure 2 shows the functionality waveform of the design. If the voltage on analog input will be higher than 600mV and PIN4 will go from LOW to HIGH an analog comparator turns on, but OUT (PIN12) will be LOW during 140µs, because after being switched ON comparator output state is undefined for maximum 100µs. 2-bit LUT2 operates as a POR controlled valve. After the chip is turned ON it makes possible the signal from PIN4 to propagate to the Delay0 input.

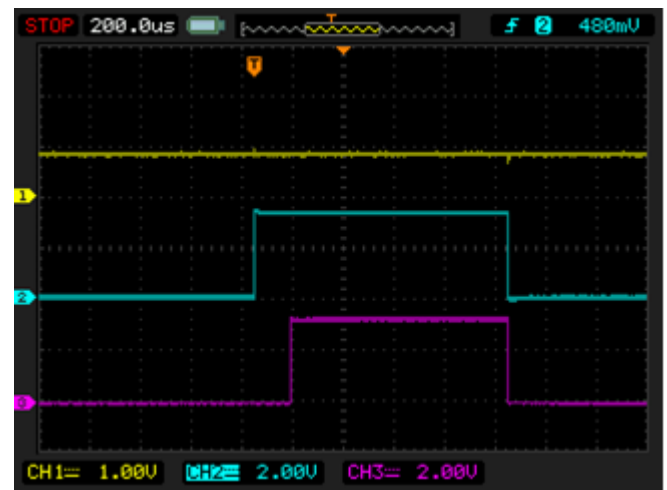


Figure 2. Dynamic switching comparator output waveform. Top line is ACMP0 input, 2nd line is Digital input, 3rd line – OUT output

Related Files

Programming code for [GreenPAK Designer](#).

Conclusion

Other features can also be included in the design such as adding a POR signal to the input logic to force initial states or creating multiple pulses. Many designs can benefit from the usage of a dynamic switches circuit which is easy to create in the Silego GreenPAK family of CMIC's.

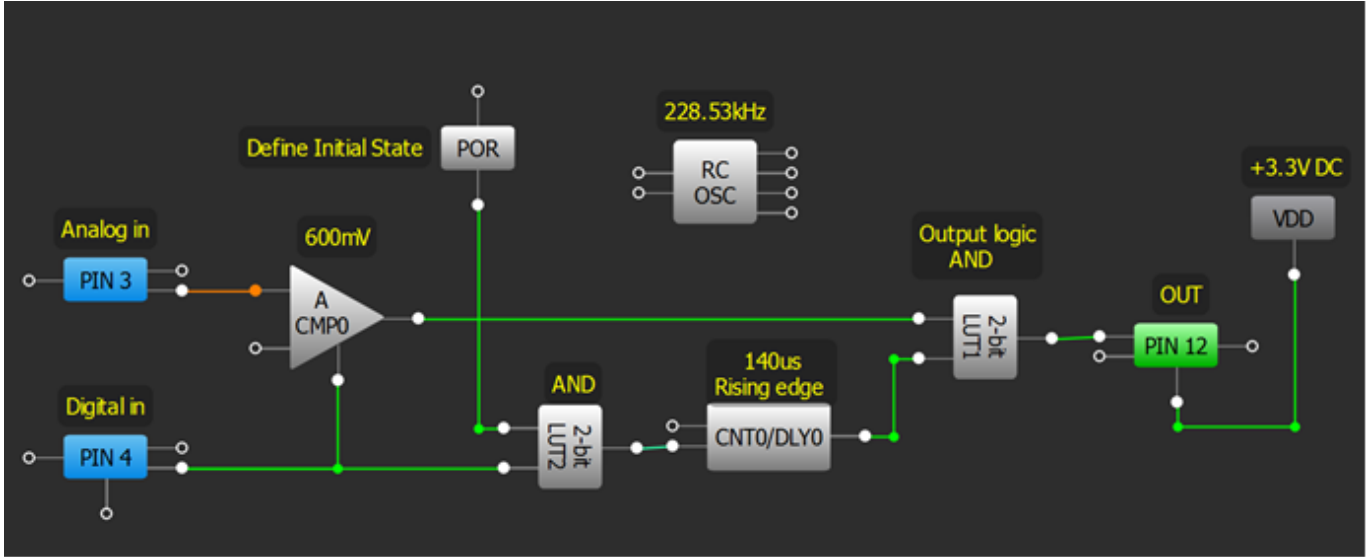


Figure 3. Dynamic switching comparator block diagram



About the Author

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Background: Oleg Basovych graduated from Lviv Polytechnic National University in 2011, studying at the Institute of Computer Science, department of Automatic Control Systems. He has 3 years' experience working as an engineer and his particular sphere of interest includes microcontrollers, the construction of high-class acoustic systems and amplifiers. At the moment he is working with the analog and digital circuits and investigating the specifics of its application.

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A	Oleg Basovych	08/19/2013	New application note

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