Design and simulation of a low voltage Schmitt trigger in CMOS Technology Based on Dynamic Threshold

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Schmitt trigger circuits has been studied in this thesis. Schmitt trigger circuits due to hysteresis in their DC characteristics have significant importance in low noise circuits and oscillators. In this article, different types of Schmitt trigger circuits are introduced and the most practical one is optimized and designed for low voltages. First of all, it is designed on the basis of dynamic voltage and optimized for wide windows. The results show that these circuits cannot have very high hysteresis width. Since one of the goals of the article is to design Schmitt trigger for practical circuits which need high hysteresis width to measure temperature, the width of hysteresis is increased by combining Schmitt trigger with other structures. Finally, the result of Schmitt trigger simulation and temperature sensor designed in CADENCE simulation software with 0.18 µ technology is discussed. The result of simulation shows that in 1-volt feed voltage, the width of hysteresis is improved by 15 percent in comparison with that in zero bias of the body. Moreover, by combining this technique by compensating transistors method we can obtain almost rail to rail window width. In addition, in this method the area occupied with transistors is decreased by 75 percent. The error of temperature measurement by temperature sensor is about 0.35 centigrade degrees in temperature region of -40 to 130 centigrade degrees by using Schmitt trigger circuit

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