Manchester encoder and Miller Encoder

Perumalla Durga Vasavi, Vignan's Foundation for Science Technology and Research

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Abstract

The purpose of this project is to implement Manchester encoder and a Miller encoder design for Ultra High Frequency Super High Frequency and Radio Frequency Identification application. Miller encoder is used in magnetic recording and also in Radio Frequency Identification. Miller encoder offers a simpler design with reduced transistor count and gives lower power dissipation higher frequency range of operation at lower supply rail as compared to other candidate designs.Further it could also be effectively applied in human identification object tracing food monitoring as well as in biomedicine etc. Proposed design also promises less propagation delay.

1 Circuit Details

Normally it has been a common practice to apply Manchester and Miller codes in telecommunications digital and optical signal transmission systems and transmission receiver designs. Proposed Miller encoder consists of one XNOR gate and one T-Flip-Flop. The XNOR gate is used to realize the Manchester encoderThe data and clock act as inputs to the XNOR gate and the output of Manchester encoded signal is passed through the T-flip flop to extract Miller encoded data.Miller encoding rules 1.when we given previous Bit i 1 as X and current Bit I as 1 then the output will be Start-up voltage level of bit i does not change, but waveform jumps upward or downward after half cycle. 2. when we given previous Bit i-1 as 0 and current Bit I as 0 then the output will be Start-up voltage level of bit i changes, and not transit after a half cycle. 3.when we given previous Bit i-1 as 1 and current Bit I as 0 then the output will be the Start-up voltage level of bit i does not change, nor transit after a half cycle. Manchester coding is self-clocking requiring no separate clock for synchronization and has no dc content.For the same bit-rate it has double the data-rate than that of the NRZ coding. By using a Digital Phase Locked Loop at the receiving end, the data could be extracted.By using a Digital Phase Locked Loop at the receiving end, the data could be extracted.

2 Implemented Circuit

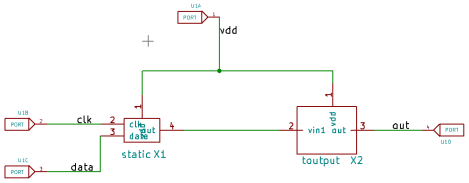

Figure 1: Implemented circuit diagram.

3 Implemented Waveforms

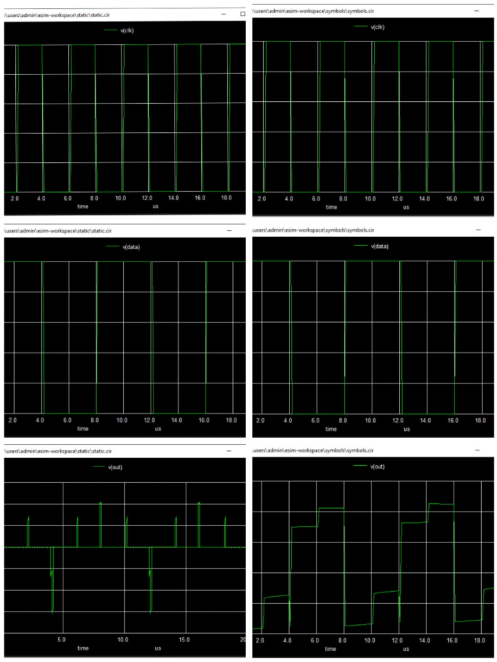

Figure 2: Implemented waveform.

References

[1] M. S. . D. P. Avireni Srinivasulu, G. Sravanthi. Finfet-based-miller-encoder for uhf and shf rfid-application. http://dx.doi.org/10.1080/00207217.2017.1354401.