Design of Multipurpose Counter

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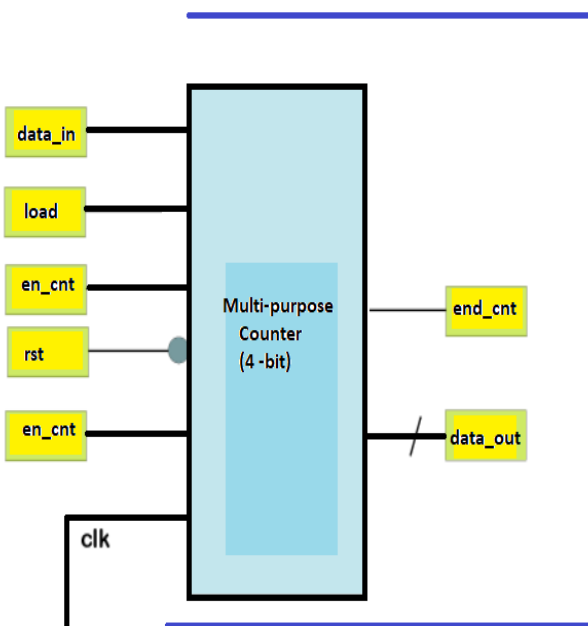*Abstract* - **This report presents a 4 four-bit multipurpose counter design written in Verilog.**

1. INTRODUCTION

The 4-bit counter starts incrementing from 4'b0000 to 4'h1111 and come back to 4'b0000. It will keep counting as long as it is provided with a running clock, and reset is held high.
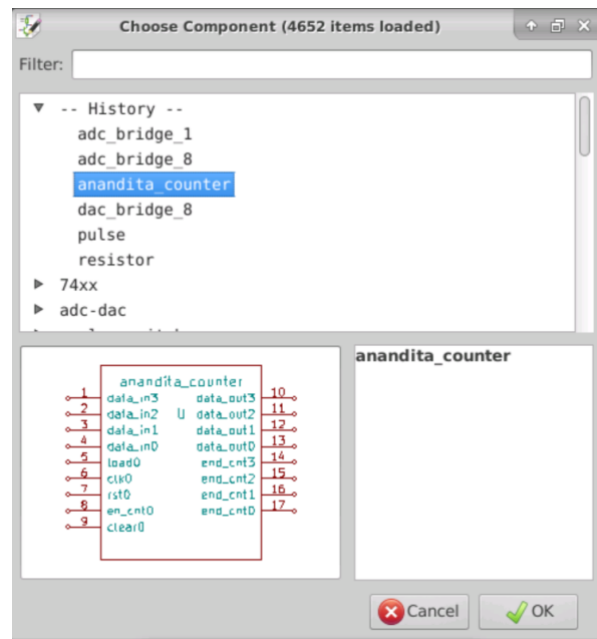
The rollover happens when the most significant bit of the final addition gets discarded. When the counter is at a maximum value of 4'h1111 and gets one more count request, the counter tries to reach 5'b10000, but since it can support only 4-bits, the MSB will be discarded, resulting in 0.
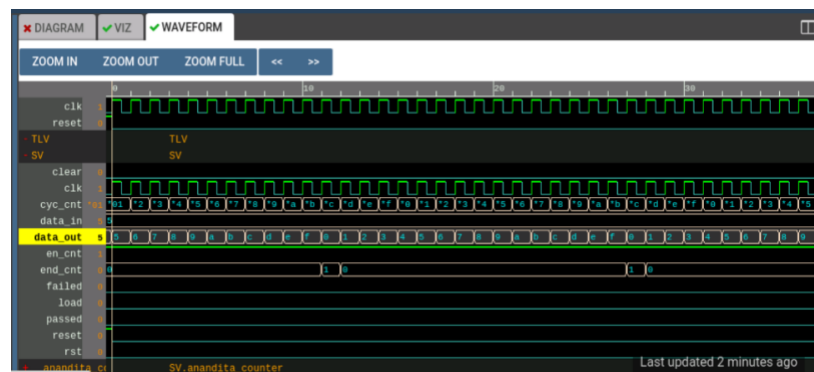
2. REFERENCE CIRCUIT DETAILS

As we can see in this multi-purpose counter, apart from counting straight from 4'h0000, we can decide the starting number using load input. In case our load pin is high, it is taking the input from data_in pin and incrementing the value thereafter. And on the output side we have end_cnt pin which gets high once counter has completed its maximum counting.

3. SYMBOL CREATED

4. OBTAINED WAVEFORM

5. REFERENCES

[1] https://www.javatpoint.com/verilog-4-bit-counter.

[2] example circuits/esim_marathon.