IMPLEMENTATION OF ASYNCHRONOUS UP COUNTER

THEJA AGARAM

MNNIT, Allahabad, India

athej777@gmail.com

Abstract —

In most of the applications counter is used to divide input clock to produce output, the frequency of the output is the divided by n times of input clock frequency. Due to these reasons ripple counters can be used as frequency dividers to reduce a high clock frequency down to a more usable value for use in digital clocks and timing applications

I. INTRODUCTION

A counter is a device which can count any particular event on the basis of how many times the particular event(s) is occurred. In a digital logic system or computers, this counter can count and store the number of times any particular event or process have occurred, depending on a clock signal. Most common type of counter is sequential digital logic circuit with a single clock input and multiple outputs. The outputs represent binary or binary coded decimal numbers. Each clock pulse either increase the number or decrease the number. Asynchronous counter can count using Asynchronous clock input. Counters can be easily made using flip-flops. As the count depends on the clock signal, in case of an Asynchronous counter, changing state bits are provided as the clock signal to the subsequent flip-flops. Those Flip-flops are serially connected together, and the clock pulse ripples through the counter. Due to the ripple clock pulse, it's often called a ripple counter. An Asynchronous counter can count 2^n - 1 possible counting states.

II. IMPLEMENTED CIRCUIT DIAGRAM

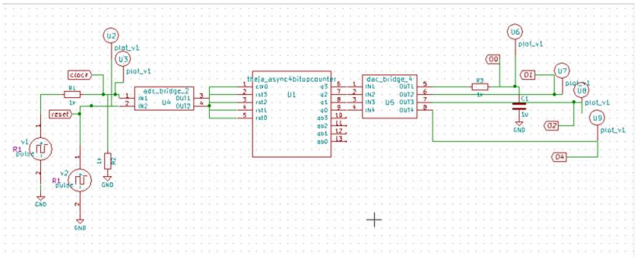

Fig.1 : 4-Bit Asynchronous counter

As shown in the figure we have four JK flip flop for 4 Bit counter and one clock as a clock source as shown in the figure. Any n bit Asynchronous counter can count **2^n - 1** possible counting states. In this given circuit will count from 0000(0) to 1111(15) states. The first flip flop F0 will react at only positive edge of the clock and all other flip flops F1, F2, F3 are react at negative edge of the clock cycle.

Here we taking digital inputs from analog to digital converter and again for ploting we use DAC converter.

OUTPUT WAVEFORMS

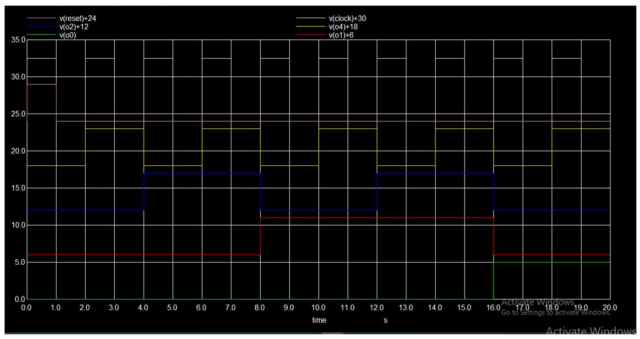

Fig.2 : Output Waveforms

Here, we can see the output waveform counting from zero to 15 in decimal value.

III. REFERENCES

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