Frequency divider using CMOS

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***Abstract*—A Frequency divider is a circuit that takes the input and divide it by specified value. It is also called clock divider. There are many circuit which use frequency dividers to generate a frequency that is a multiple of a reference frequency. It has a vital role in Phase locked loop frequency synthesizers. Frequency dividers can be implemented for both analog and digital application.**

Keywords—synthesizers, PLL

I. INTRODUCTION

D type flip flop is used as a frequency divider .It can be seen from the fig.1 frequency waveforms above, that by "feeding back "the output from q bar to the input terminal d, the output pulses at q have a frequency that are exactly one half (f/2) that of the input clock frequncy.The circuit function is to divide or drop the frequency of the high frequency signal to get the lower frequency signal for a given frequency signal by division. Analog frequency dividers are less common and used only at very high frequencies. Digital dividers implemented in modern IC technologies can work up to tens of GHz. An arrangement of flip flop is a classic method for integer-n division.

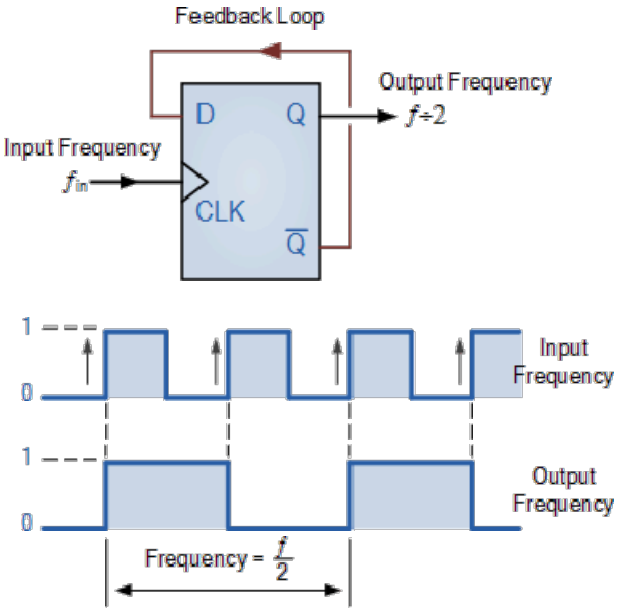

Fig.1 D-flip-flop as a frequency divider

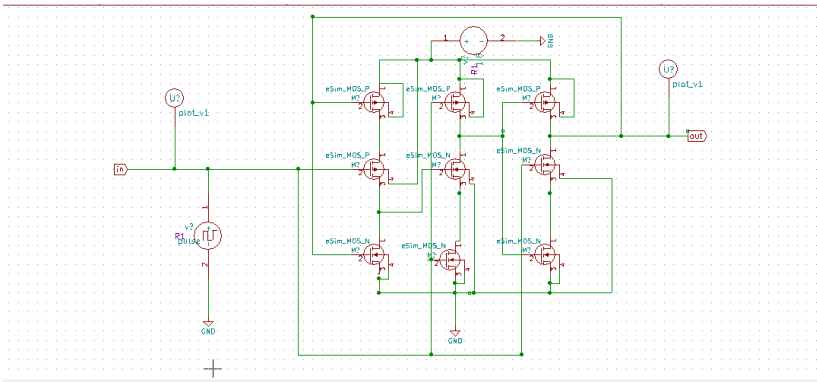

Fig.2 frequency divider

output waveform

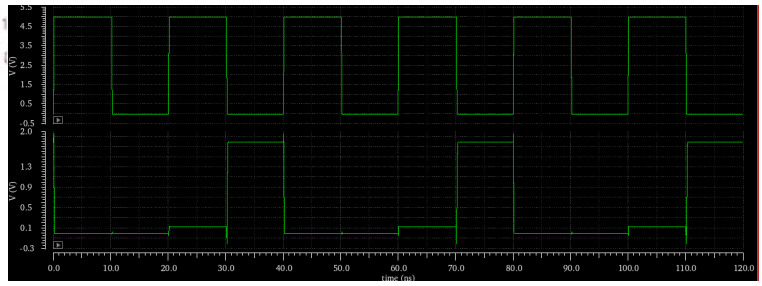

Fig. 3 waveform of frequency divider

Reference:

[1] Tong Yu, Shexiang Ma and Kun Guo, "Design of the equal duty ratio arbitrary integer frequency divider based on FPGA", Journal of Tianjin University of Technology, vol24, 2008, p.86

[2] Xiaohong Yu, Qingxin Cao and Tao Yang, "Design and precision analysis of dual-modules frequency divider with regulable duty ratio", Application of Electronic Technique, vol8,2009, p.49

[a] Sample of a Table footnote. (*Table footnote*)

Fig. 1. Example of a figure caption. (*figure caption*)

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[1] G. Eason, B. Noble, and I. N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. *(references)*

[2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.

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[4] K. Elissa, "Title of paper if known," unpublished.

[5] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.

[6] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].

[7] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.

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