

Design and Analysis of CMOS Source Follower using 28nm Technology

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Abstract- The source follower also known as the Common drain amplifier has a very wide variety of applications in analog electronics which include buffers and level shifters. It has a unity voltage gain and provides a low output impedance. This design is implemented on a Synopsys tool to check the output waveform of the CMOS source follower in 28nm technology.

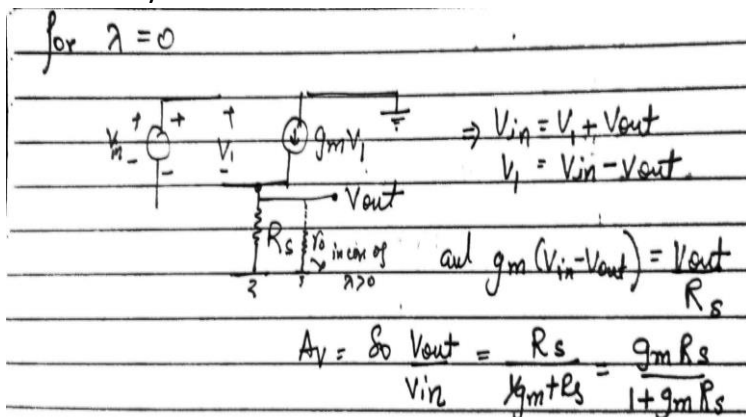
1.Introduction

A buffer circuit is used to prevent circuit dysfunctionalities as it can drive a low impedance load with very little loss of signal strength and minimum possible noise. The source follower provides a high voltage gain with high load impedance. This buffer is commonly used in many high speed integrated circuits attached to the amplifiers.

The gain of a common drain amplifier is given by-

$$A_v = g_m R_s / (g_m R_s + 1)$$

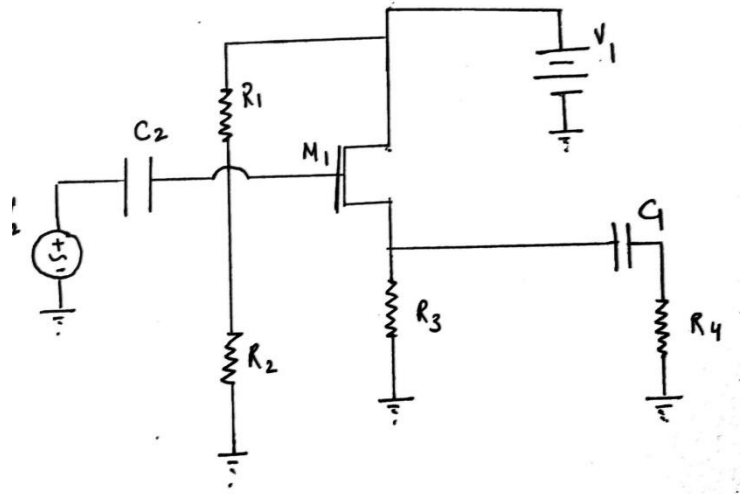
This is achieved by the small signal analysis of the source follower-



And the output impedance is given by-

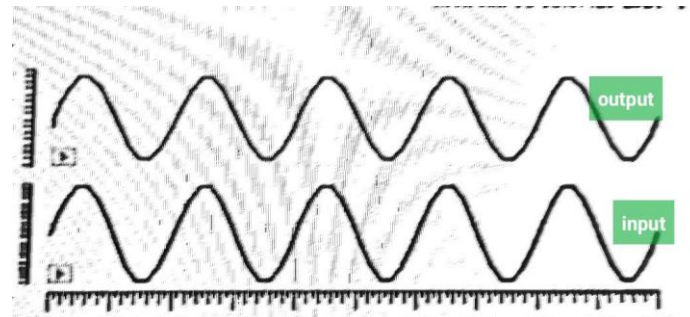
$$Z_{out} = R_s || 1/g_m$$

2.REFERENCE CIRCUIT DESIGN



3.REFERENCE WAVEFORM

Transient Analysis



4.REFERENCES

1. Design of Analog CMOS integrated circuits, Behzad Razavi
2. Design and Analysis of Super Source Follower, Asst. Prof Guru Prasad, MIT Manipal
3. Analysis and Design of CMOS Source Followers and Super Source Follower Mr. D. K. Shedje1 Mr. D. A. Itole, Mr. M. P. Gajare, and Dr. P. W. Wani