

Research Migration Project

<https://esim.fossee.in/research-migration-project>



Name of the participant: Gowrabathina Chaithanya

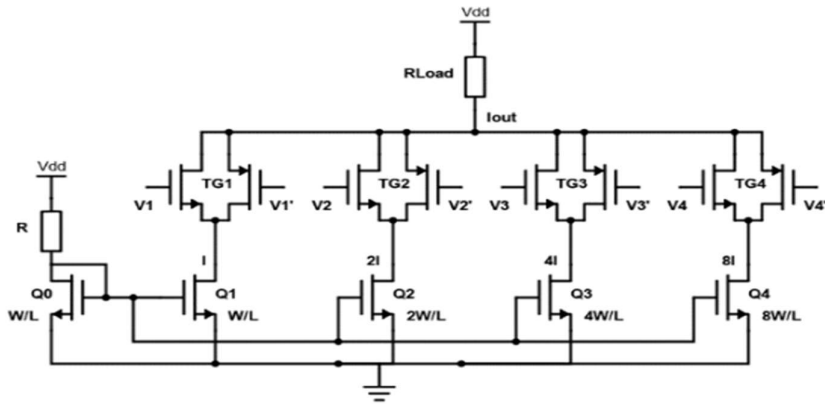
Institution: Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Tirupati, Andhra Pradesh, India.

Title of the circuit: Design and implementation of 4-bit binary weighted current steering DAC

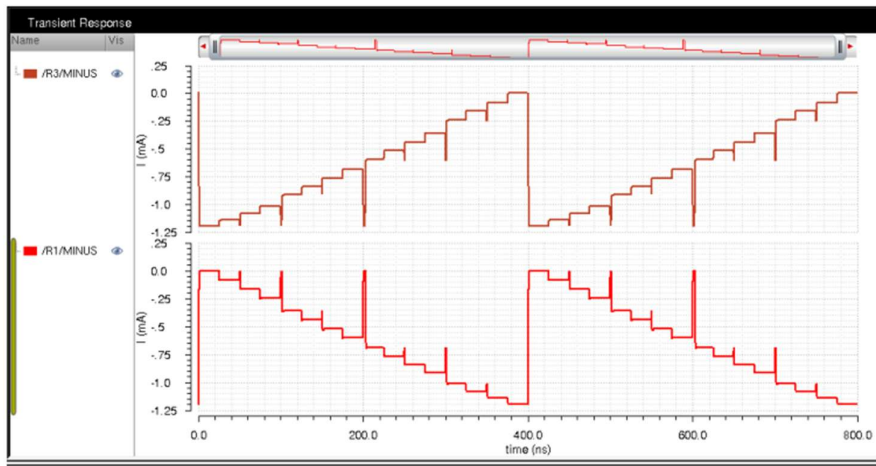
Description: This project presents the design and simulation of a high-speed binary weighted current steering Digital-to-Analog Converter (DAC) using CMOS technology in the esim environment. The circuit utilizes binary-weighted current mirrors to generate scaled currents corresponding to digital input bits. CMOS transmission gates are employed to steer these currents towards the output based on input logic. The summed current produces an analog output proportional to the digital input. A load resistor is used to convert the output current into voltage for analysis. The design focuses on achieving high-speed operation and accurate conversion. Simulation results are used to verify functionality and evaluate performance parameters such as linearity and response time. This work demonstrates an efficient approach for implementing high-speed DACs in VLSI systems.

Expected Outcome: The designed current steering DAC is expected to accurately convert digital input signals into corresponding analog output voltage. The output waveform should exhibit a step-like variation proportional to the applied binary input. The circuit should demonstrate high-speed switching with minimal delay. Proper functioning of current mirrors and switching network will be verified through simulation. The linearity of the DAC, including basic observation of output levels, is expected to be maintained. The design should also show stable operation with correct current summation at the output node. Overall, the simulation results will validate the effectiveness of the proposed CMOS-based current steering DAC for high-speed applications.

Circuit Diagram:



Expected Results :



Source/Reference(s):

<https://spie.org/samples/TT97.pdf>

<file:///C:/Users/Bharath%20Kumar/Downloads/22576-44990-1-PB.pdf>