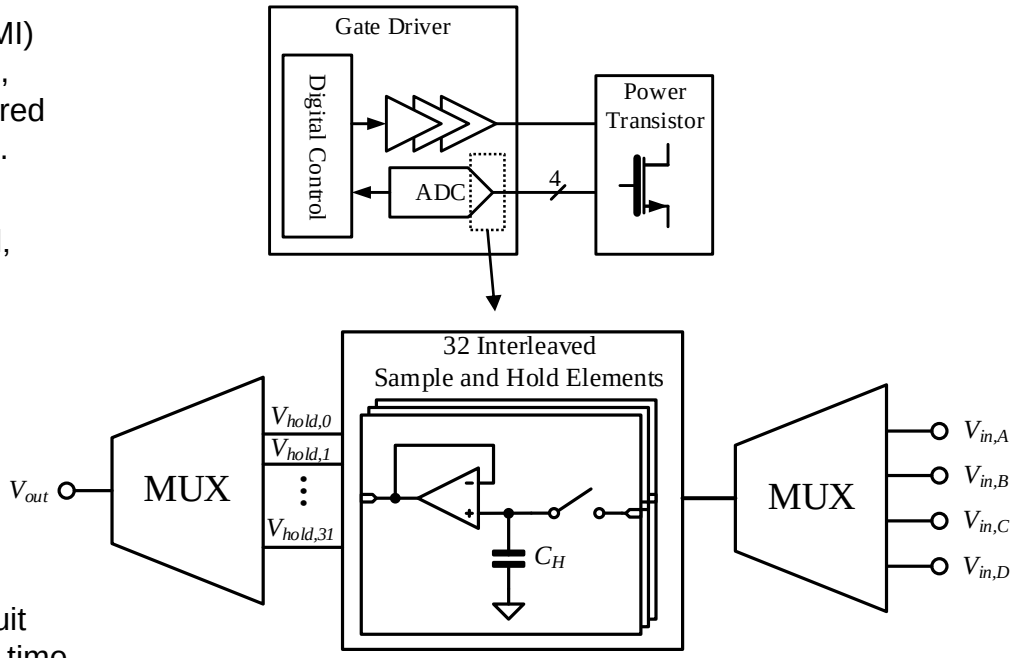
Design of an Input Stage for Burst Mode Analog-to-Digital Converters

Background

In the field of E-mobility, electromagnetic interference (EMI) due to power inverters becomes increasingly problematic, especially considering the simultaneous increase in required data throughput between sensor nodes in the automobile.

To increase the EMI performance, sophisticated control strategies of the inverter‘s switching behavior are needed, necessitating fast and accurate measurements of the inverter‘s switching elements during transition.

The comparably small ratio of transition time to switching period allows the use of a burst mode ADC instead of a continuously-sampling ADC.



Task

The goal is to develop and implement an input stage circuit with four selectable inputs which is suited for the use in a time-interleaved burst mode ADC, i.e. sampling using a parallel array of said input circuits.

For this, the optimal trade-offs between accuracy, input range, chip area and other figures of merit have to be found.

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