3-Bit Flash Analog to Digital Converter (ADC) Using eSim

Sajja Pratyusha
Pre-Final Year B.tech (Dept of ECE)
Rajiv Gandhi University Of Knowledge Technologies, Nuzvid
sajjapratyusha@gmail.com

Abstract
Flash adc is also known as parallel adc. It is formed of a
series of comparators, each one comparing the input signal
to a unique reference voltage . the comparator outputs connect
to inputs to priority encoder circuit built gates ad diode which
then produces binary output. Flash converters are extremely
fast compared to many other types of ADCs.
This paper explains   simulation of flash type adc using eSim.

INTRODUCTION
A flash ADC gives nonlinear response to the analog input signal.
The flash converter designed in this paper is the simplest
and efficient ,being limited only in comparator and gate
propagation delays. The circuit is implemented using
eSim,an integrated tool with Makerchip IDE,
KiCad,Ngspice,GHDL and verilator.
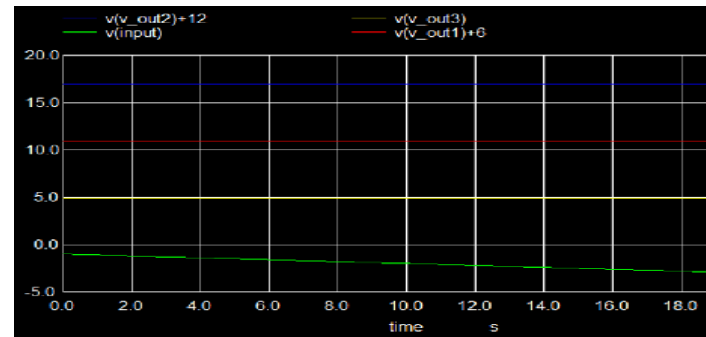
IMPLEMENTED CIRCUIT DIAGRAM

IMPLEMENTED WAVEFORMS
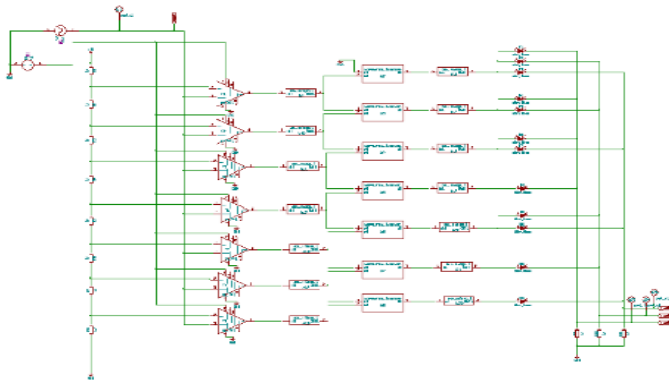
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This three-bit flash ADC requires seven comparators. It has
seven op-amps and seven Ex-OR gates. Vref is a stable reference
voltage provided by precision voltage regulator as part of converter
circuit and Vin is 5v. The Vref used here is PWL wave and its connected
to non inverting terminal of op-amp.Due to the nature of sequential comparator
output states the same highest-order-input selection effect through set of Ex-OR
gates,allowing use of simpler,non priority encoder.In Makerchip using verilog code
for Ex-OR gate and other components are in-built in eSim which is used to
simulate mixed signal.