DESIGN OF 8-BIT FLASH ADC

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Abstract

We are designing an 8-bit Flash ADC. Flash ADC is one of the fastest ADCs out there being used in high-speed applications such as in Digital and Analog Communications, DSO, Cell phones, audio/video devices etc.

We are determined to make a Flash ADC with sampling rate of at least 100 MHz, INL and DNL less than 1 LSB so that no missing codes appear in the transfer function. Here we are designing Comparator and TM2B components in Verilog as we are dealing with digital design. The approach and architecture we will be using is based on certain factors such as low power consumption, high sampling rate with no missing codes.

The main components we will be using are listed below:

- Voltage Divider Circuit
- Comparators (2^n – 1, where n is the number of bits)
- Thermometer to Binary (TM2B) Encoder

Undergrad Subjects used:

- Digital System Design (UEC612)
- Integrated System Design (UEC535)
- Linear Integrated Circuits (UEC512)
- MOS Circuit design (UEC750)
- Digital Signal Processing (UEC502)
- Digital Communication (UEC607)

IEEE standards:

- 1241-2010 - IEEE Standard for Terminology and Test Methods for Analog-to-Digital Converters.
- 1364-2005 – IEEE Standard for Verilog Hardware Description Language

- PC37.92 – IEEE Standard for Analog Inputs to Protective Relays from Electronic Voltage and Current Transducers
- P1241 – Standard for Terminology and Test Methods for Analog-to-Digital Converters