Design of 8 - bit DAC using eSim.

VAISHNAVI M P, Bannari Amman Institute Of Technology, Sathyamangalam

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ABSTRACT: This paper introduces the design of 8 - bit DAC using eSim software. An analog voltage or digital voltage can be measured and subsequently processed by a computer. A converter device with the necessary precision is required to provide the computer with the digital n-bit equivalent of the voltage as applied to the DAC circuit. For the 8 bit DAC, the sub circuits 7bit-DAC.sub and switch.

INTRODUCTION:

A digital to analog converter is a device which converts digital data to analog signal. Here the input is 8-bit digital data to DAC and output is to be an analog voltage. Signals can be easily stored and transmitted in digital format but in order to be recognized by human or non-digital systems it should be converted to analog.

1. REFERENCE CIRCUIT DETAILS:

Connecting digital circuitry to sensor devices is simple if the sensor devices are inherently digital themselves. A DAC, inputs a binary number and outputs an analog voltage or current signal. In block diagram form, it is as follows:

Fig 1

In Fig 1 DAC consists of a number of binary inputs 0 or 1 bit and gives single output. In general, the number of binary inputs of a DAC will be a power of two.

The digital data are entered through the 8 lines (D0 to D7) which is to be converted to an equivalent analog voltage by the mean of the R/2R resistor network. Commercial Digital to Analog converter ICs.

Take 7-bit DAC as a sub circuit to simulate 8-bit DAC in eSim software. The sub circuit of 8 bit DAC was created which included 7bit DAC and switch. If n bit data is given as input to digital to analog converter, then 2^n voltage levels can be obtained as output. Here**, there are 8 digital input bits and hence 256 steps in the analog output.**

2. IMPLEMENTED CIRCUIT:

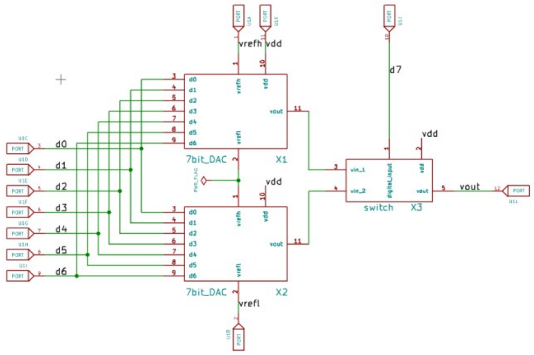

Figure 2: Implemented circuit Diagram.

REFERENCES:

1. https://www.idc-online.com/technical_references/pdfs/electronic_engineering/8-bit%20Digital%20to%20Analog%20converter%20(DAC).pdf

2. https://microcontrollerslab.com/dac0808-8-bit-digital-to-analog-converter/