

KNOWLEDGE PROBE 2: Digital-to-Analog Converters Data Conversion Part 1

Learning Objectives

1. Describe the R-2R, string, and switched current source methods of DAC.
 2. List and explain the major specifications of a DAC.
 3. Define multiplying DAC.
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1. Which of the following is NOT one of the main components of a DAC?
 - a. Conversion network
 - b. Input shift register
 - c. Reference source
 - d. Switches
 2. The purpose of the R-2R network is to
 - a. Divide the reference into voltage increments
 - b. Generate an output current proportional to the binary input
 - c. Store the binary input
 - d. Switch the reference voltage off and on according to the binary input
 3. What is the conversion circuit in a string DAC?
 - a. Current divider
 - b. MOSFET switch network
 - c. Storage register
 - d. Voltage divider
 4. What is the most common semiconductor device used to switch the conversion network in a DAC?
 - a. BJT
 - b. Diode
 - c. MOSFET
 - d. SCR
 5. Most DACs produce an output
 - a. Current
 - b. Voltage
 6. What circuit converts the DAC output to a voltage?
 - a. MOSFET switch
 - b. Op amp
 - c. R-2R network
 - d. Shift register



7. What sets the output voltage or current range of a DAC?
 - a. MOSFET switches
 - b. Number of bits
 - c. R-2R network
 - d. Reference source
8. It is not possible to package more than one DAC in an IC.
 - a. True
 - b. False
9. Some DACs have a serial input.
 - a. True
 - b. False
10. What is settling time?
 - a. The same as the clocking period
 - b. The time it takes for the analog output to change from one level to another
 - c. The time it takes for the analog output to come within 1 LSB of the desired output after an input binary change
 - d. The time it takes to load the binary input word into the DAC
11. What is one LSB of resolution in a 10-bit DAC with a 5 volt reference input?
 - a. 2.44 mV
 - b. 4.88 mV
 - c. 9.8 mV
 - d. 19.53 mV
12. Which term refers to the characteristic of a DAC to always have an increasing output with an increasing binary input value?
 - a. Differential non-linearity
 - b. LSB resolution
 - c. Monotonicity
 - d. Settling time
13. What is the difference between one bit increment of change and one LSB of resolution called?
 - a. Differential non-linearity
 - b. Monotonicity
 - c. Resolution
 - d. Settling time
14. A multiplying DAC performs multiplication on
 - a. One analog and one digital input
 - b. Three input values
 - c. Two analog voltages
 - d. Two binary numbers



15. Reference voltages are usually
- a. 1 to 5 volts
 - b. 1 to 10 volts
 - c. 2 to 5 volts
 - d. 5 to 10 volts